

# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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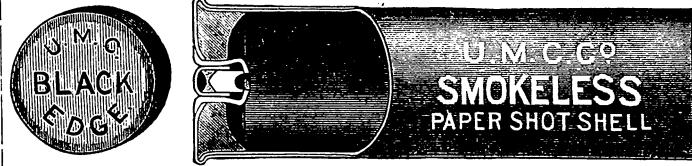
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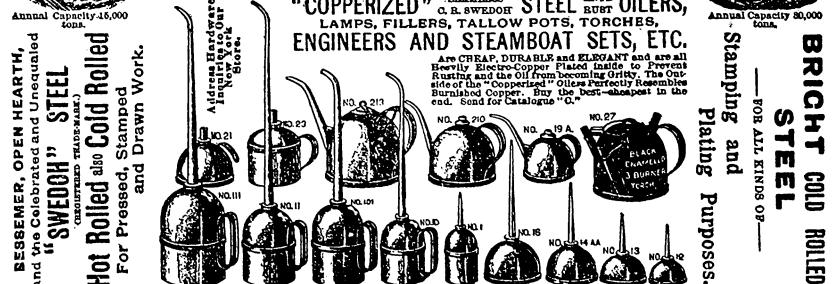
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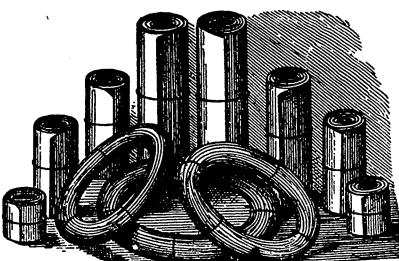
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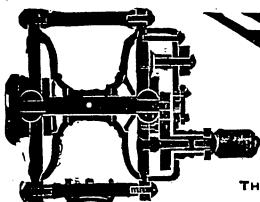
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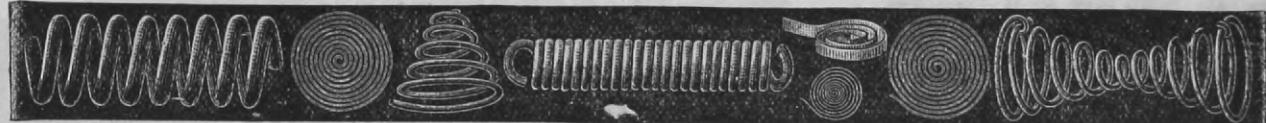
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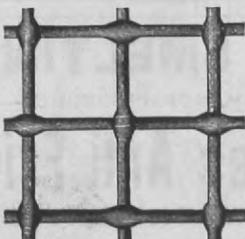
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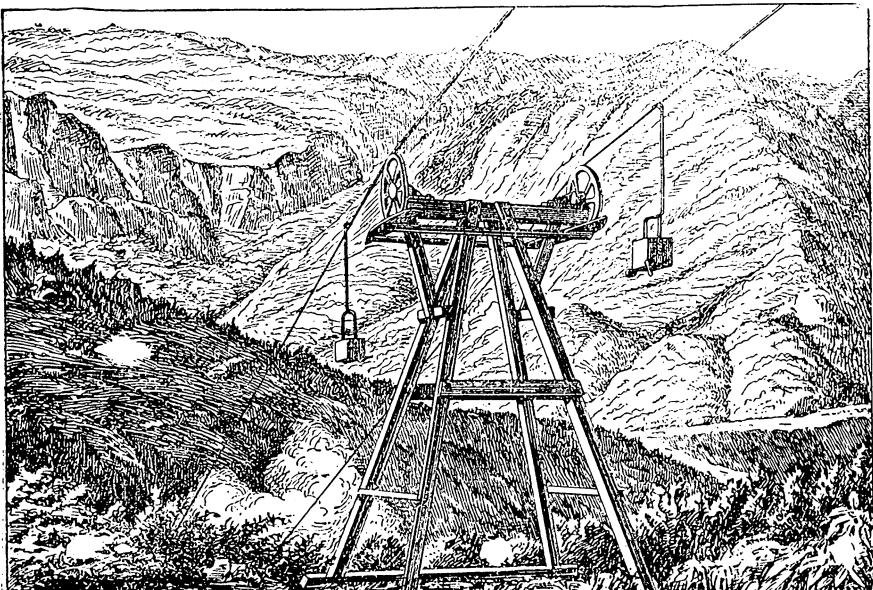
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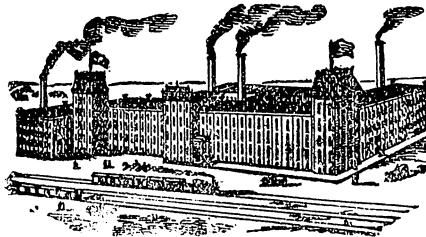
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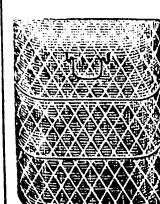
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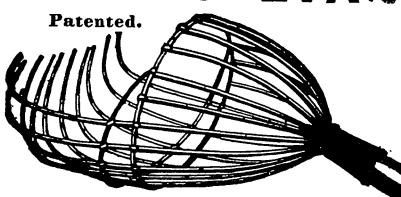
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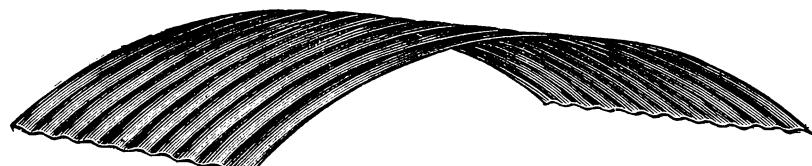
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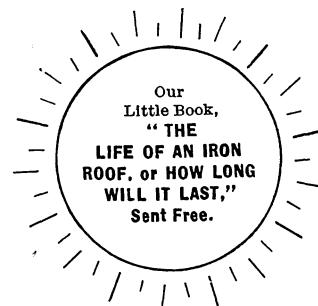
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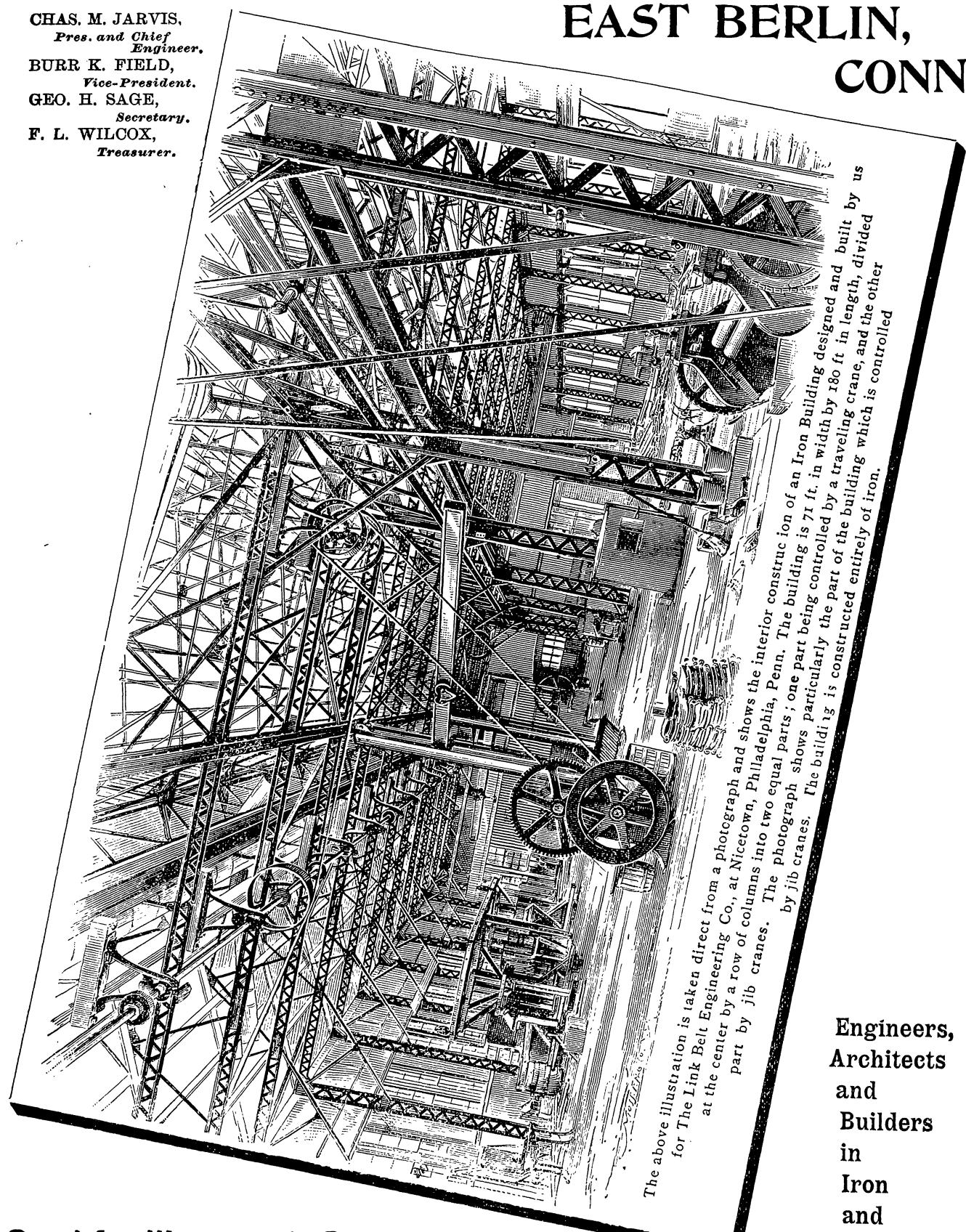
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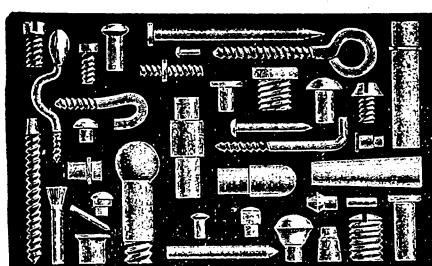
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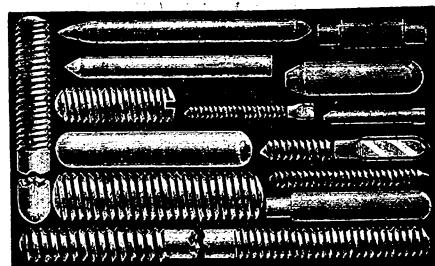


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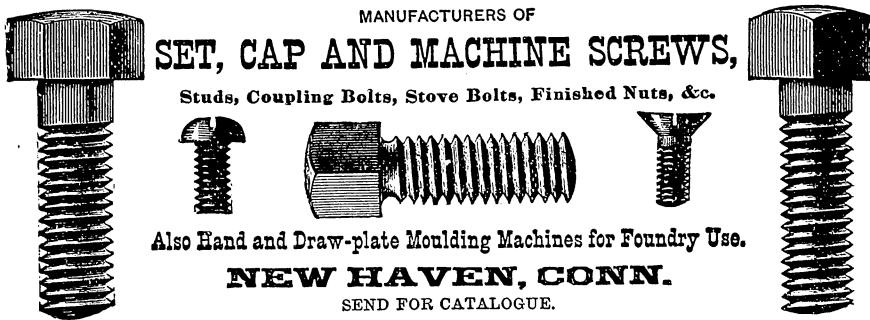


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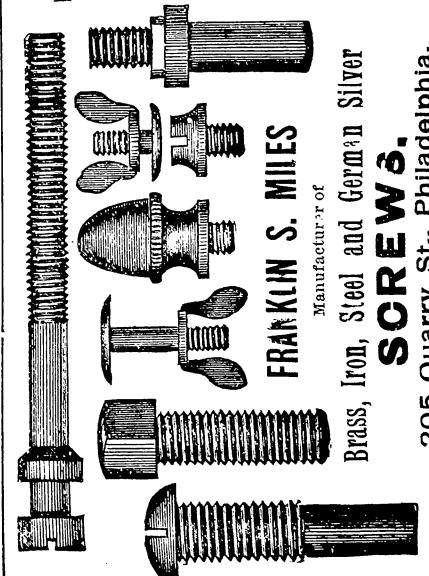
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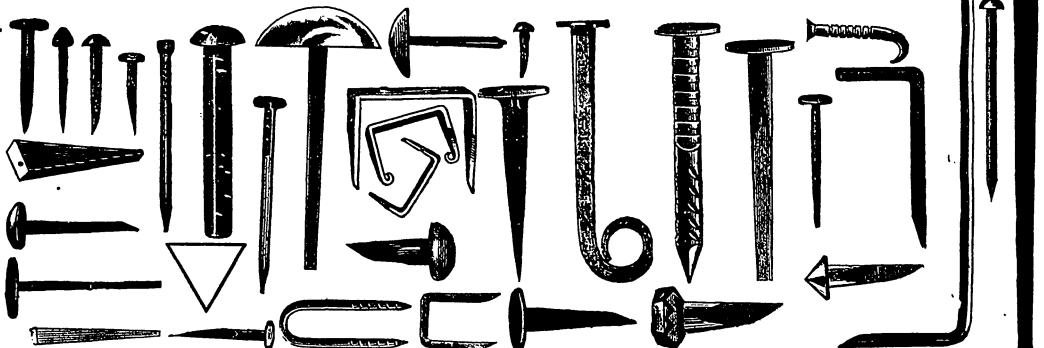
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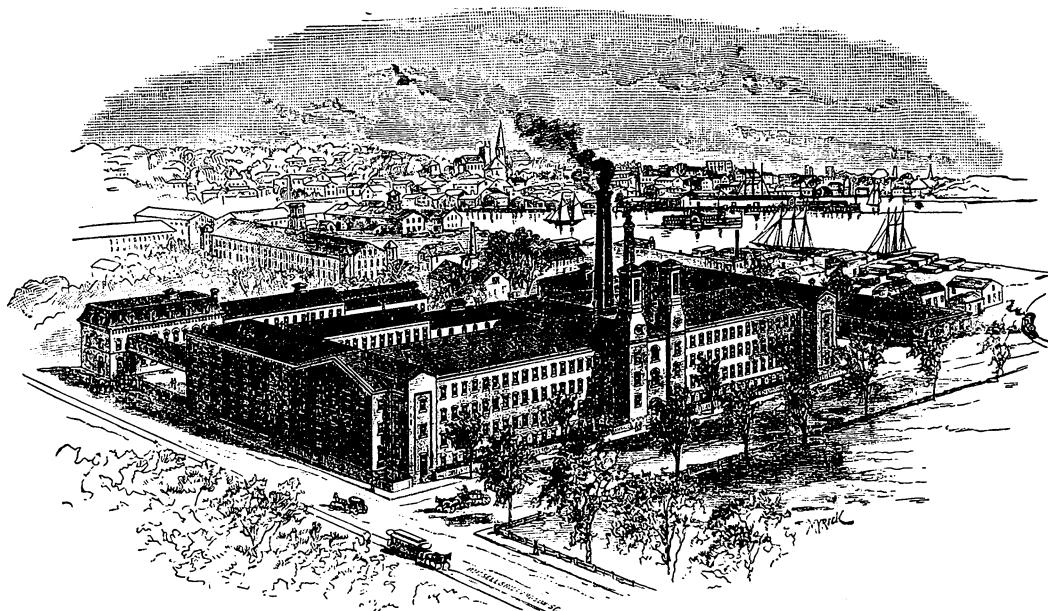
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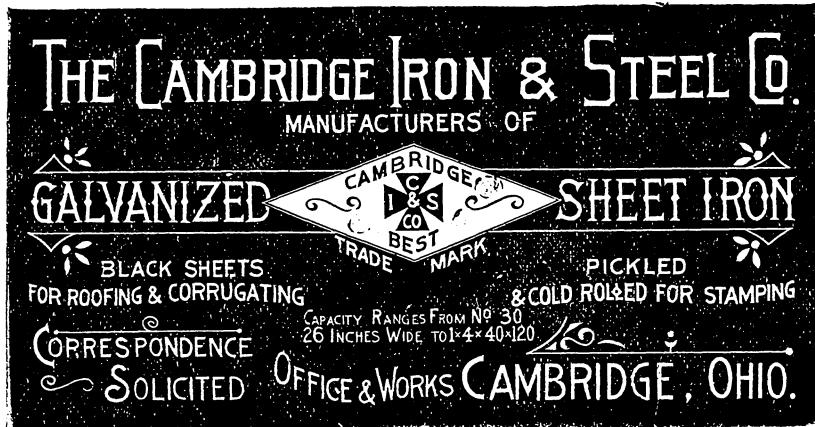
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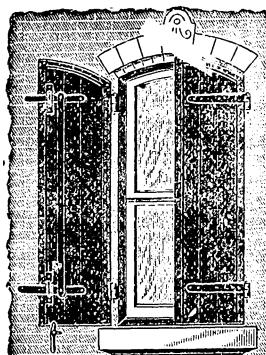
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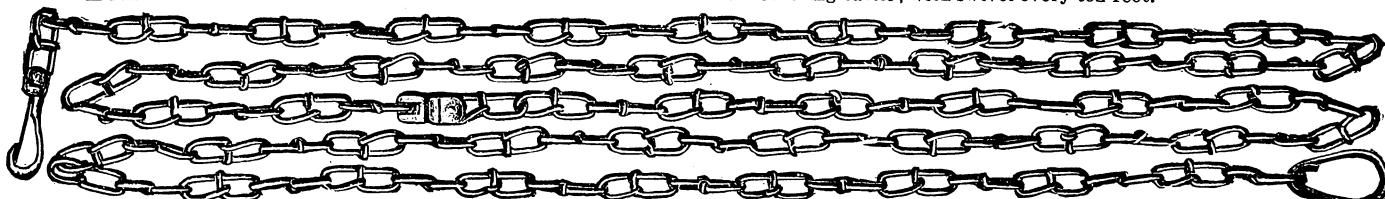
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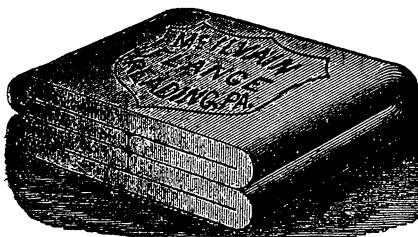
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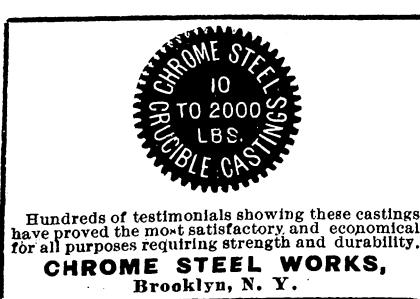
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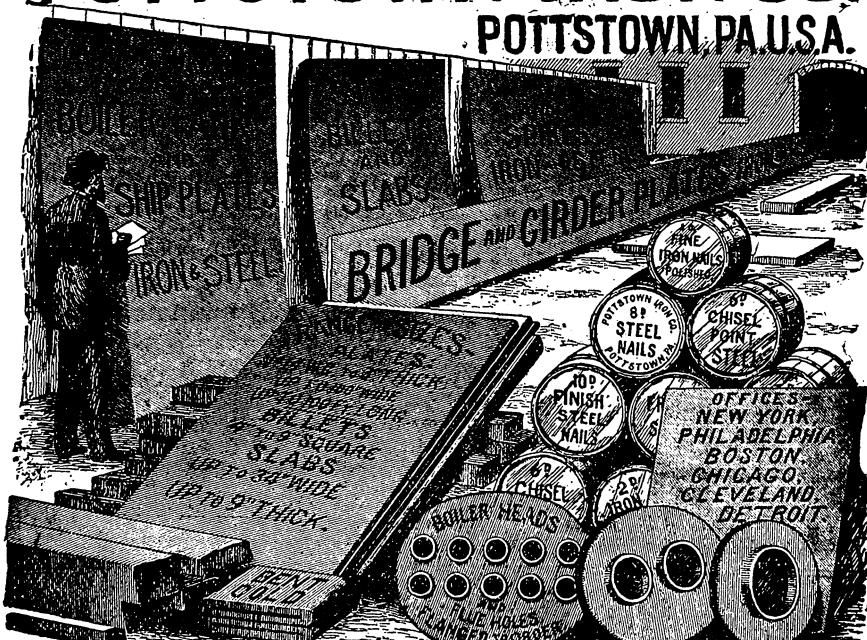
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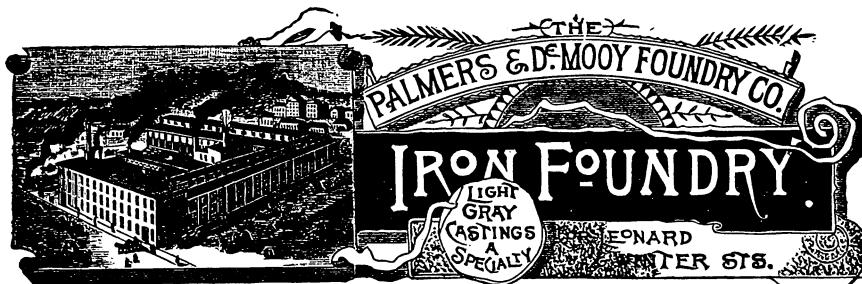
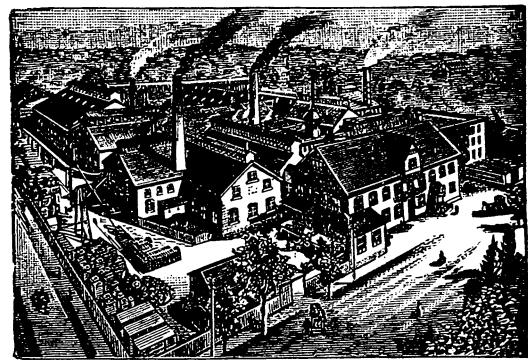
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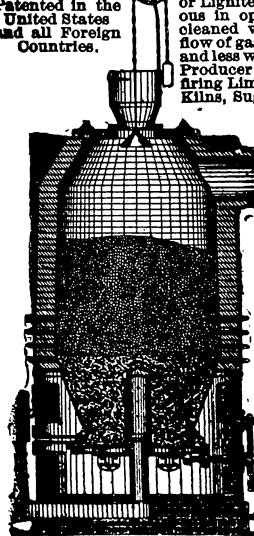
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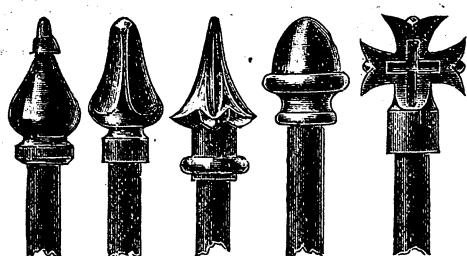
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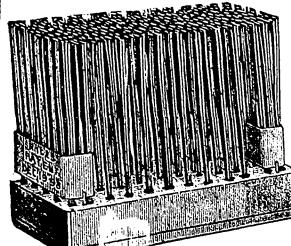
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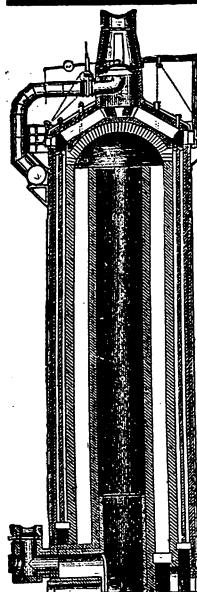
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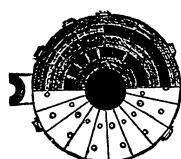


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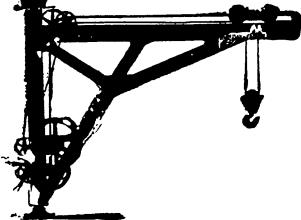


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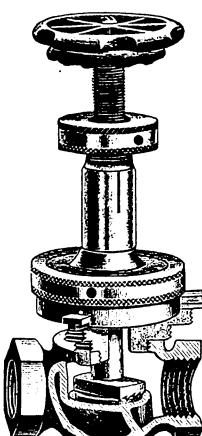
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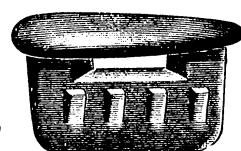


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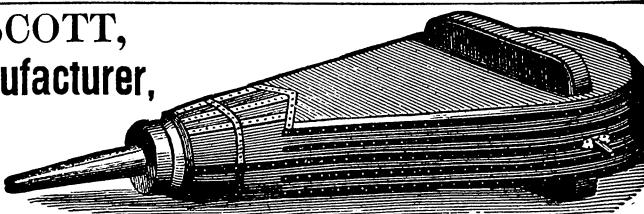


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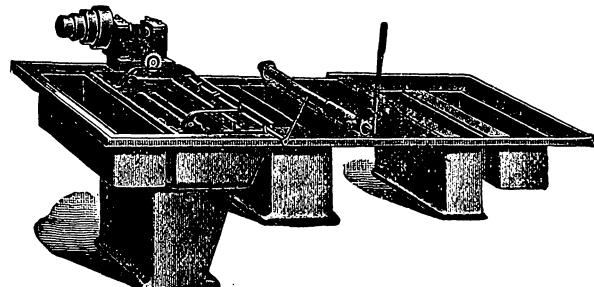
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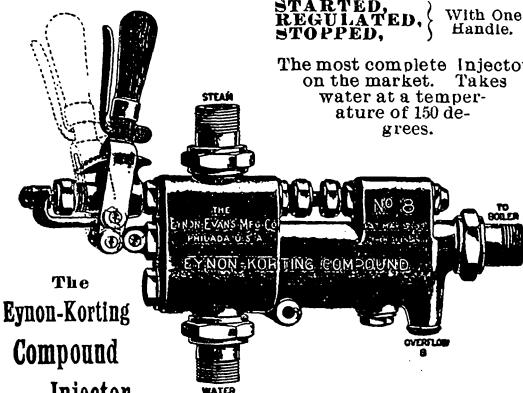


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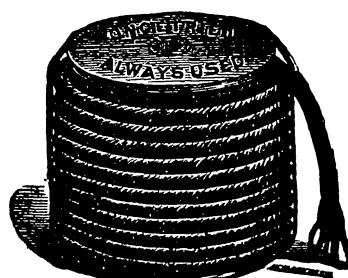
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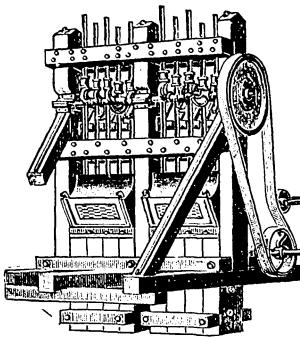


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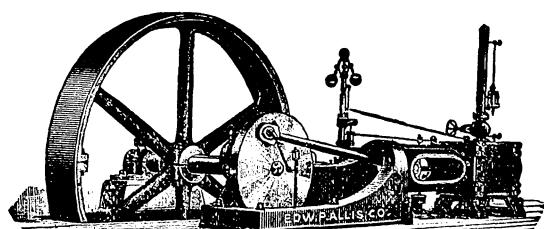
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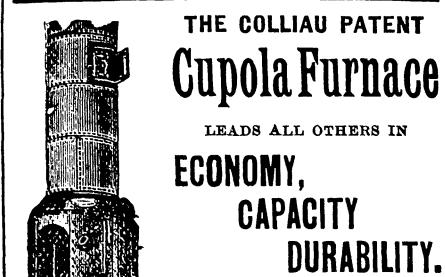
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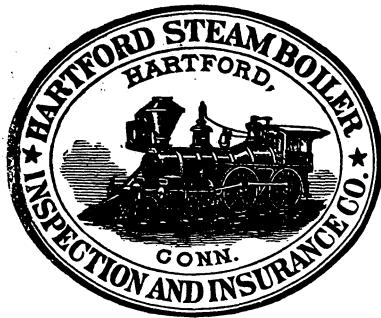
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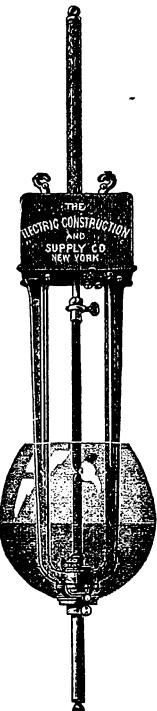
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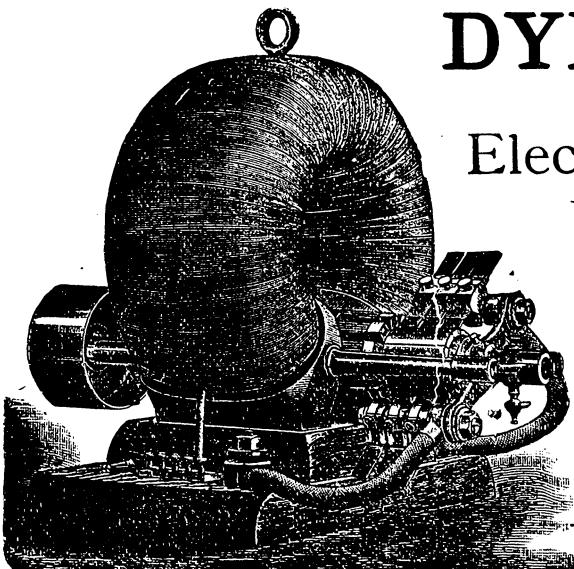
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IV. PRACTICAL PART. CHAPTER IV. ARRANGEMENT OF ELECTRO-PLATING ESTABLISHMENTS IN GENERAL; ELECTRO-PLATING ARRANGEMENTS IN PARTICULAR. V. TREATMENT OF THE METALLIC ARTICLES. (a) Mechanical Treatment; (b) Chemical Treatment. VI. PROCESSES OF ELECTRO-DEPOSITION; REDUCTION OF METALS WITHOUT A BATTERY (Electro-Deposition by Contact). VII. DEPOSITION OF NICKEL AND COBALT. I. Nickelizing; 2. Cobaling. VIII. DEPOSITION OF COPPER, BRASS AND BRONZE. 1. Coppering; 2. Brassing (Copper Deposit); 3. Bronzing. IX. DEPOSITION OF SILVER. X. DEPOSITION OF GOLD. XI. DEPOSITION OF PLATINUM AND PALLADIUM. 1. Deposition of Platinum. 2. Deposition of Palladium. XII. DEPOSITION OF TIN, ZINC, LEAD AND IRON. 1. Deposition of Tin; 2. Deposition of Zinc; 3. Deposition of Lead; 4. Deposition of Iron (Steeling). XIII. DEPOSITION OF ANTIMONY, ARSENIC AND ALUMINUM. 1. Deposition of Antimony; 2. Deposition of Arsenic; 3. Deposition of Aluminum; XIV. GALVANOPLASTY (Reproduction). 1. Galvanoplastic Deposition in the Cell Apparatus; 2. Galvanoplastic Deposition in the Battery and Dynamo Machines. XV. COLORING, PATINIZING, OXIDIZING, ETC., OF METALS. LACQUERING. XVI. APPARATUS AND INSTRUMENTS. XVII. HYGIENIC RULES FOR THE WORKSHOP. XVIII. CHEMICAL PRODUCTS USED IN THE ELECTRO-PLATING ART. XIX. USEFUL TABLES. INDEX.

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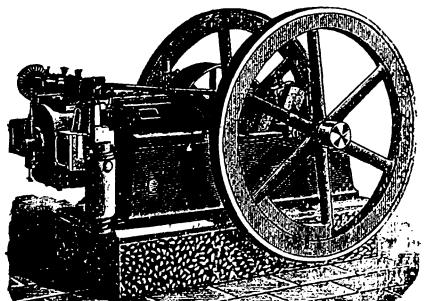
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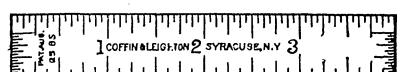
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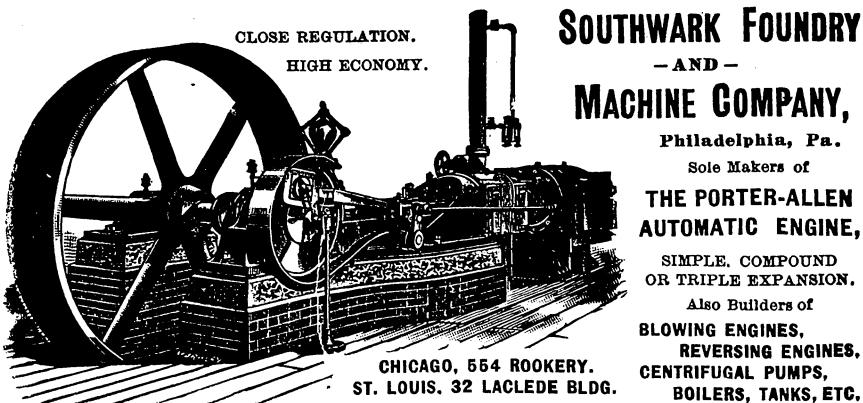
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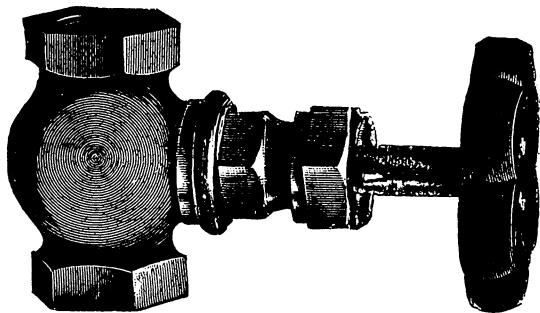
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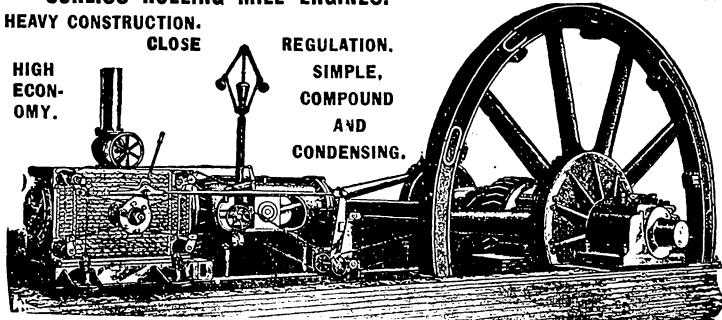
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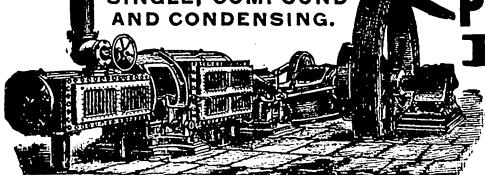
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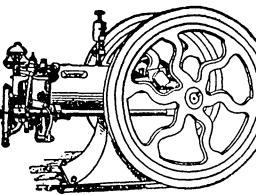
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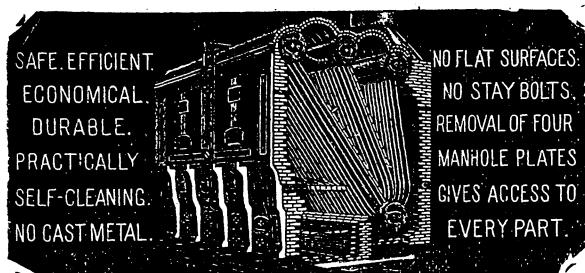
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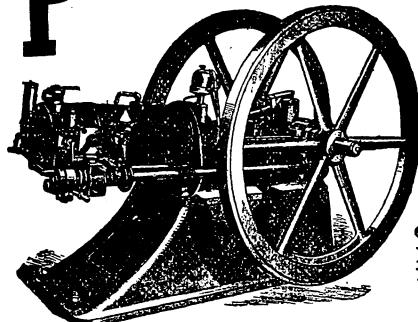


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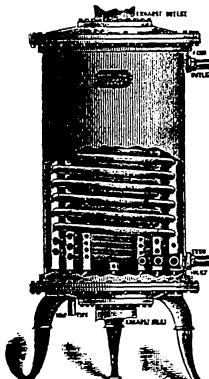
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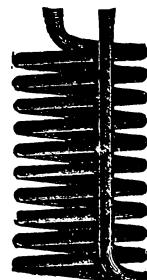
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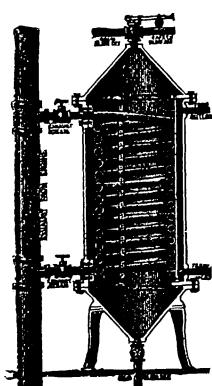
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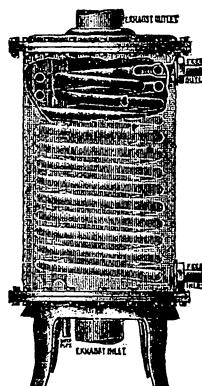
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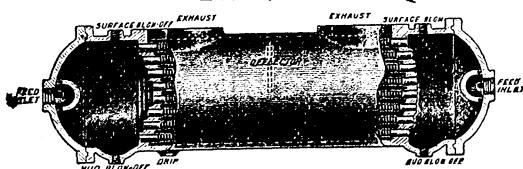
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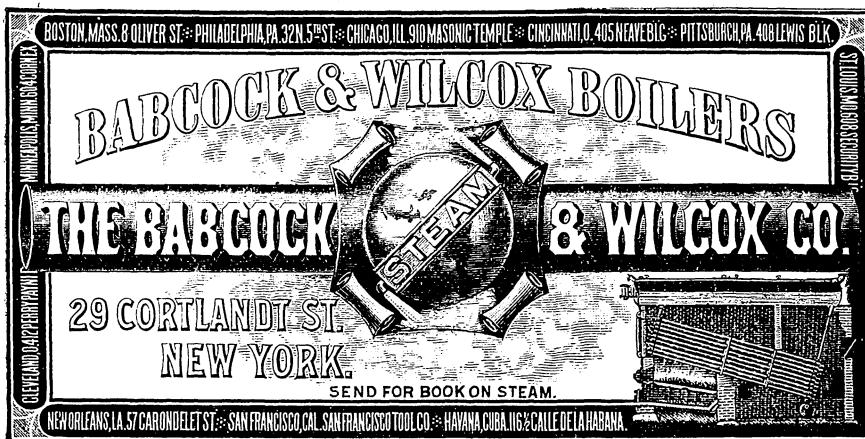
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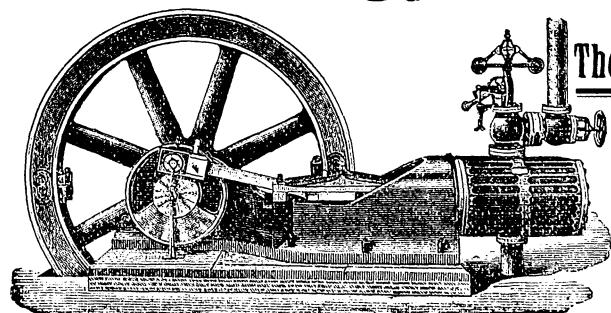
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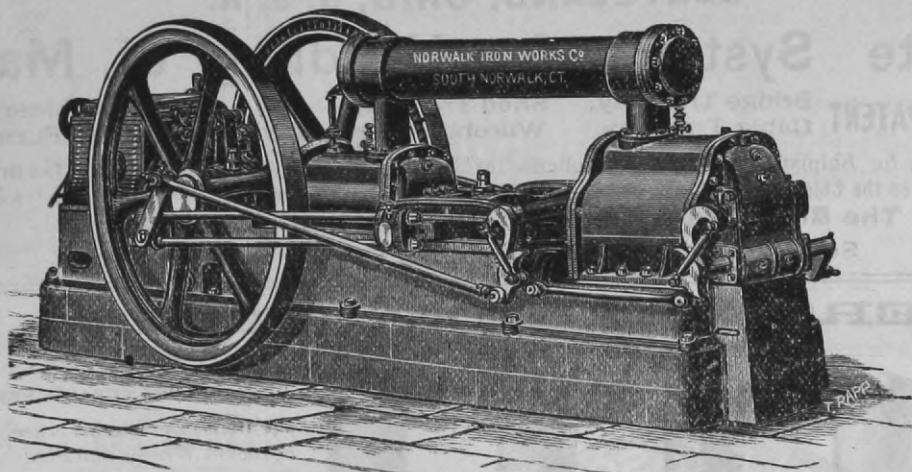
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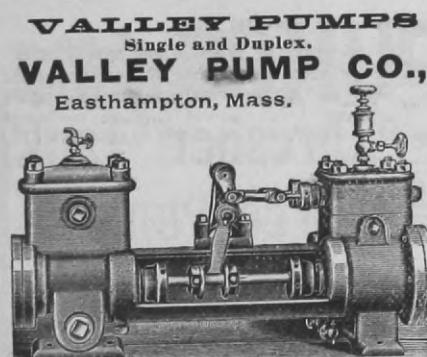
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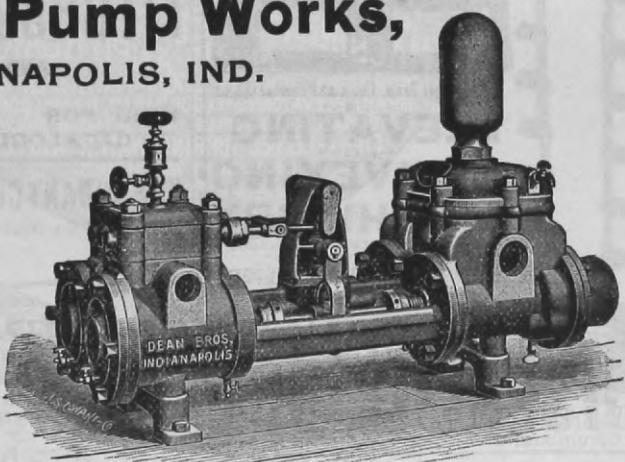
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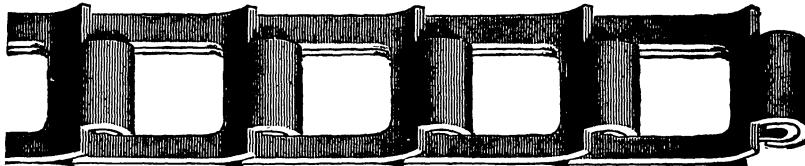
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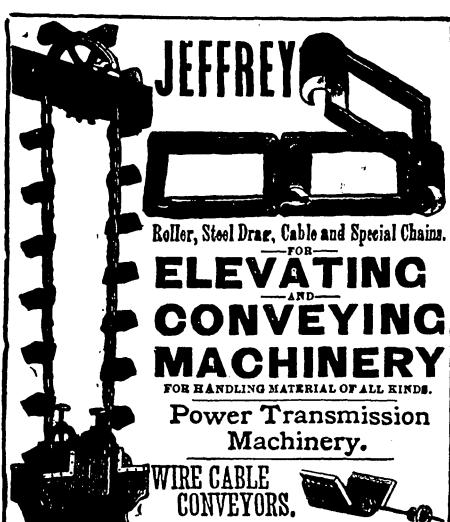
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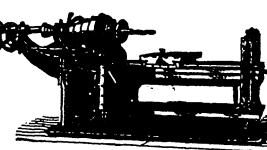
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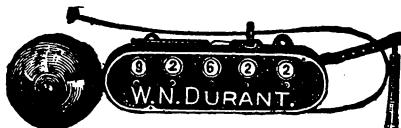
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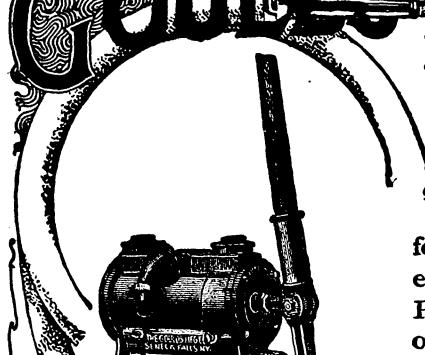
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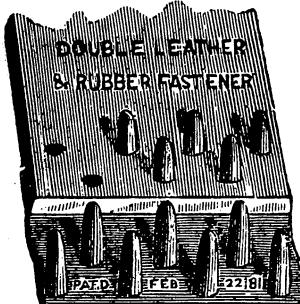
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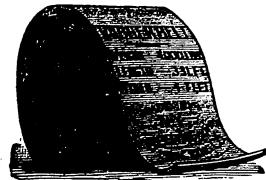
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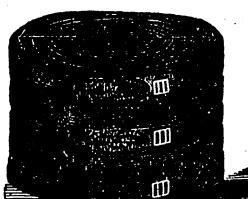


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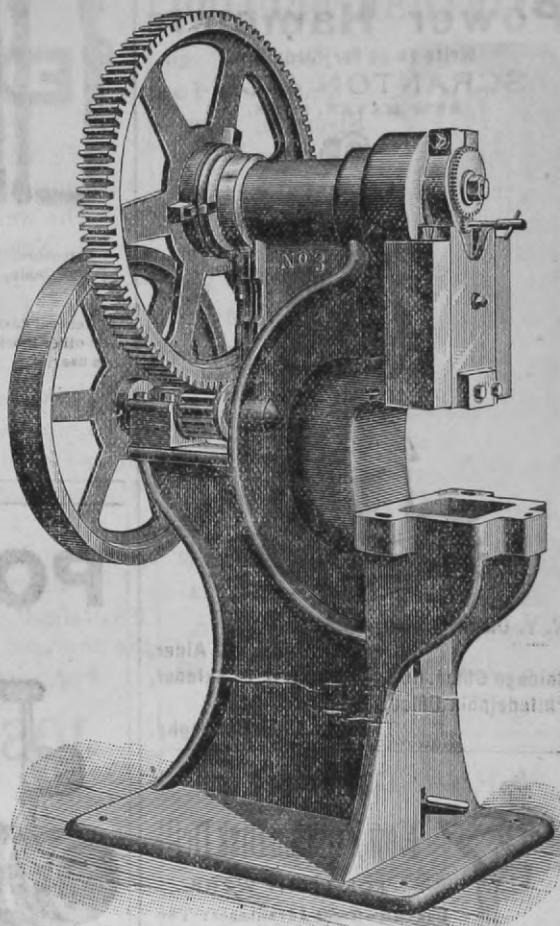
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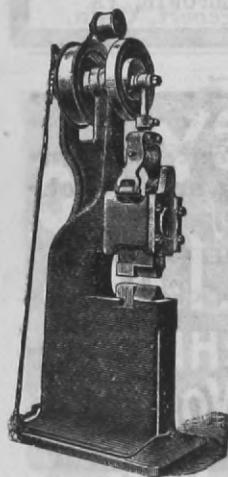
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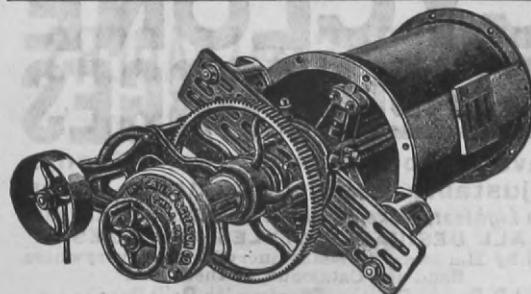


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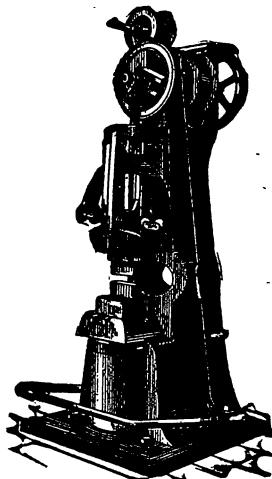
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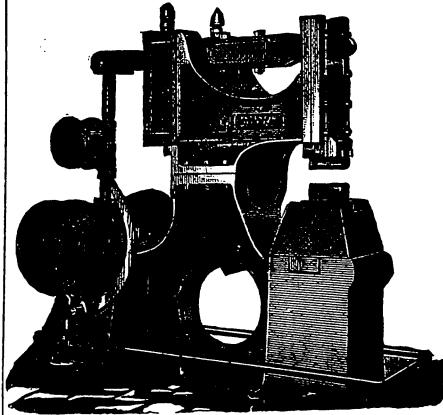
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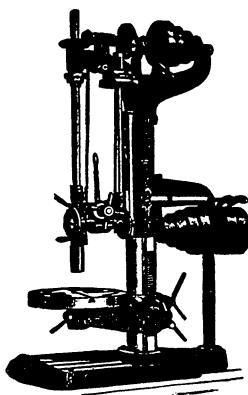
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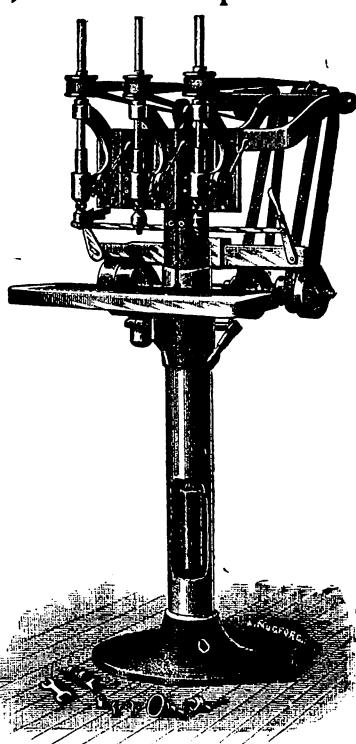
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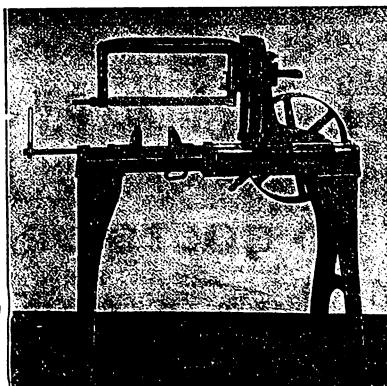
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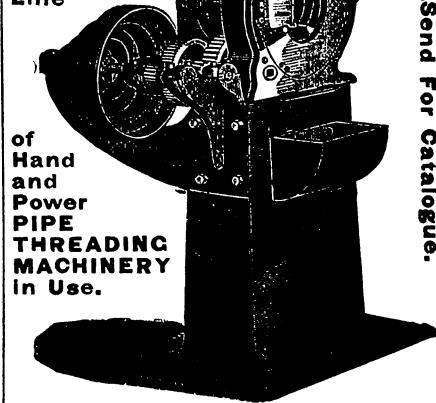
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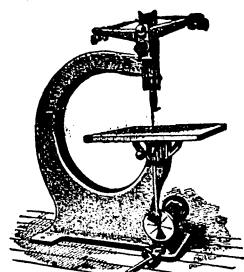
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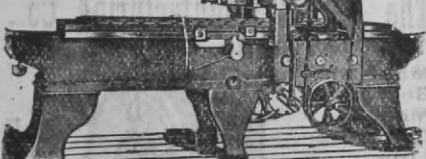
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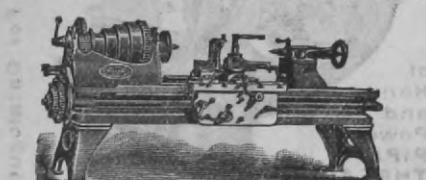
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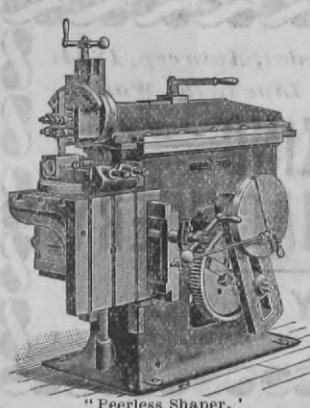
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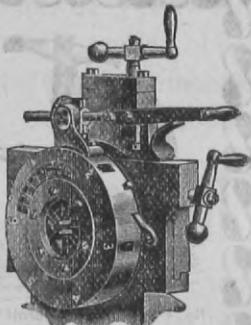


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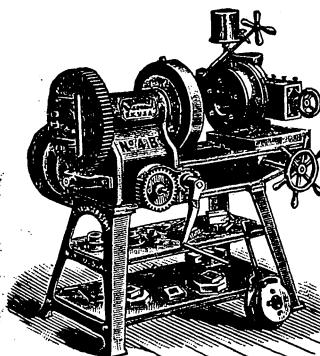
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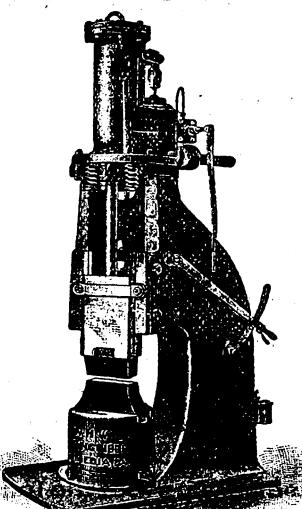
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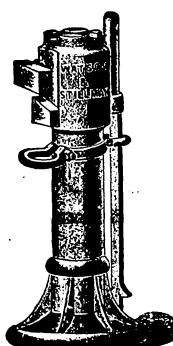
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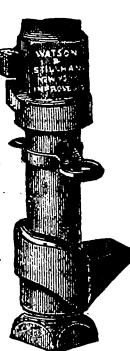


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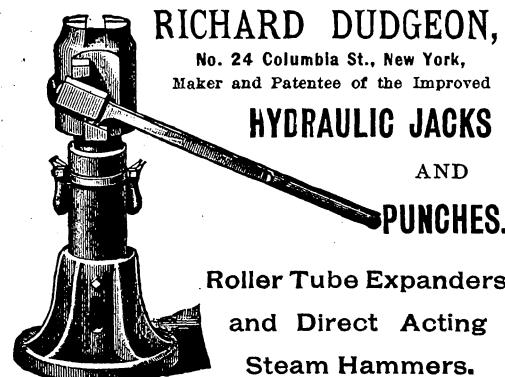
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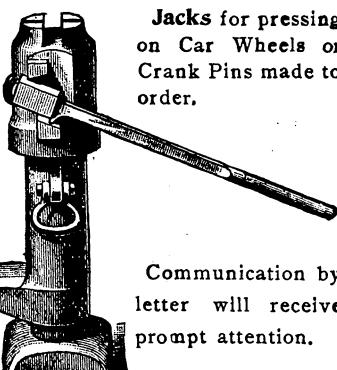
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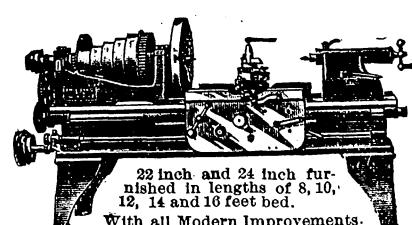
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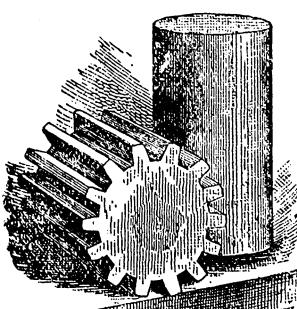
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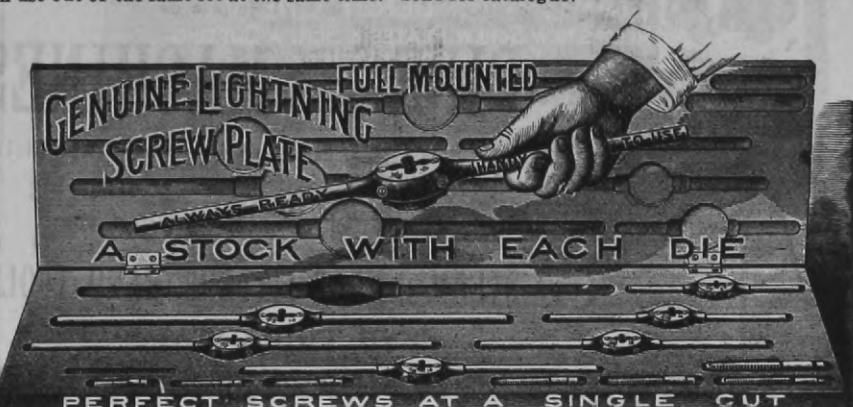
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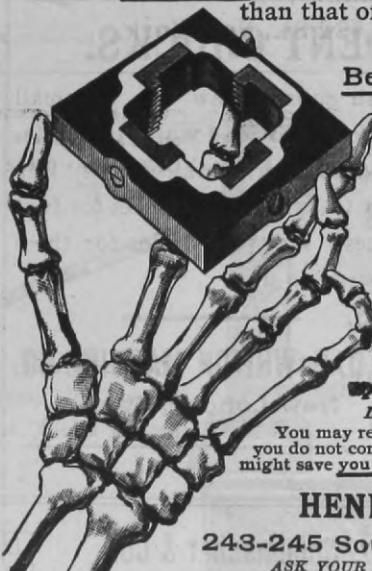
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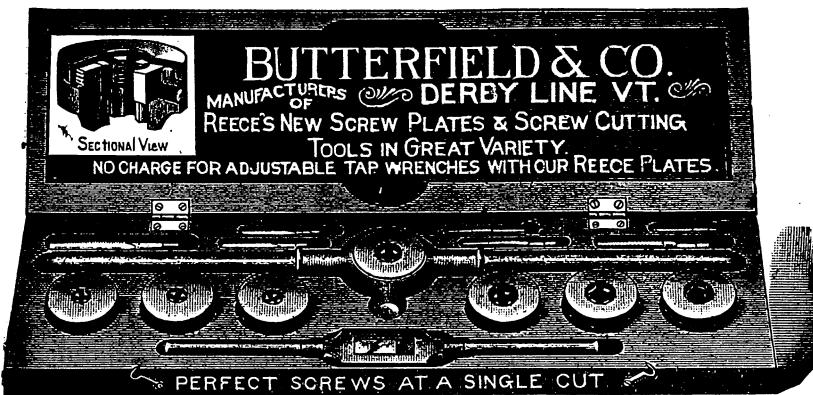
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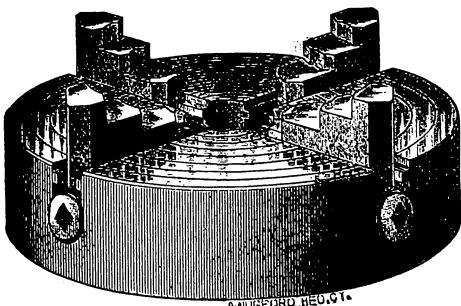
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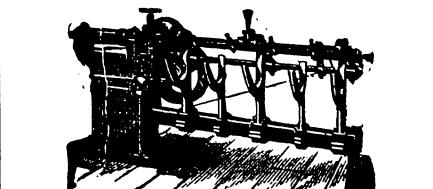
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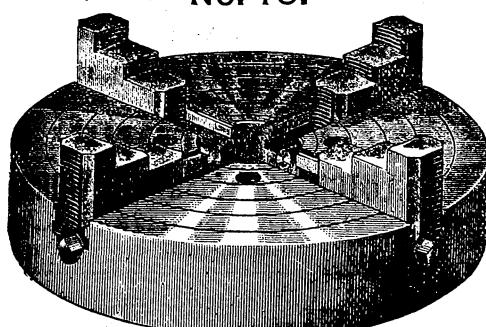
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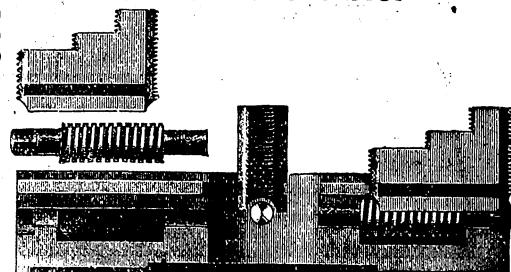
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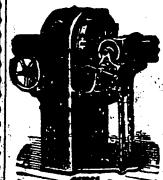


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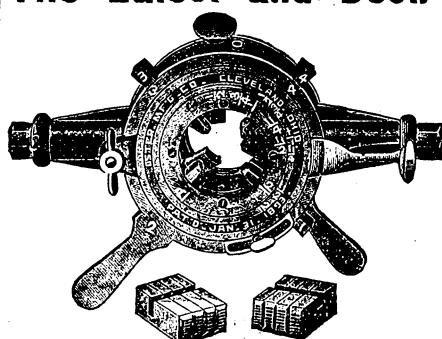
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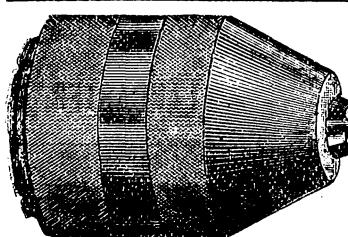
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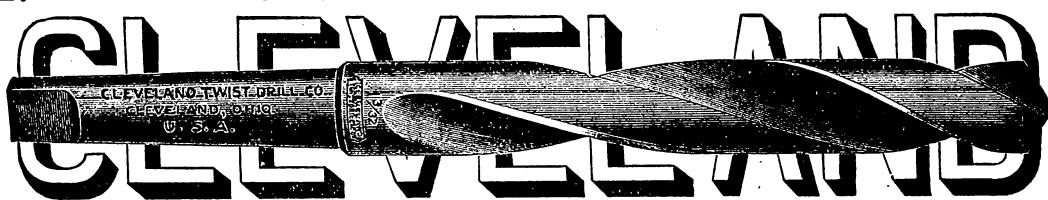
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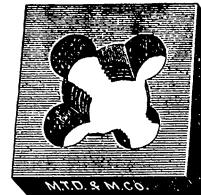


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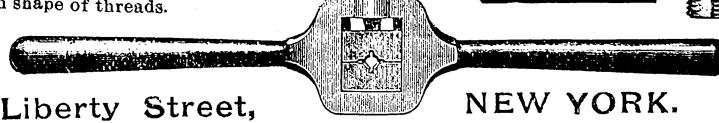
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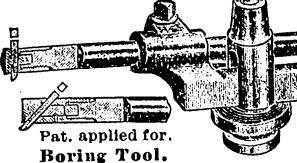
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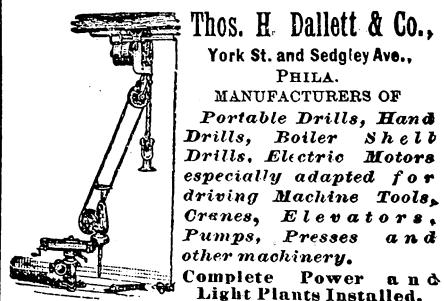
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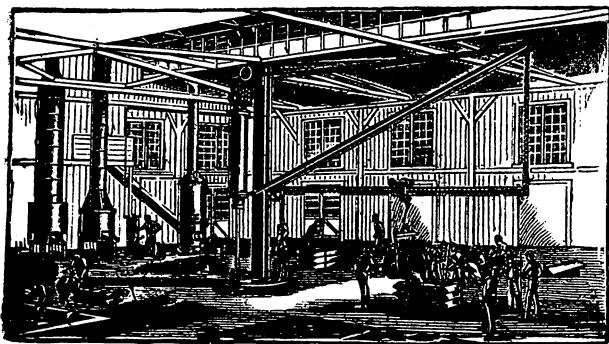
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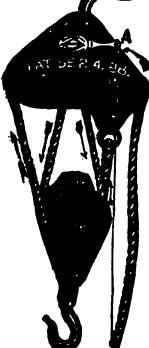
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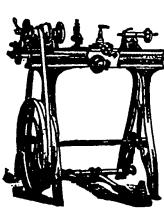
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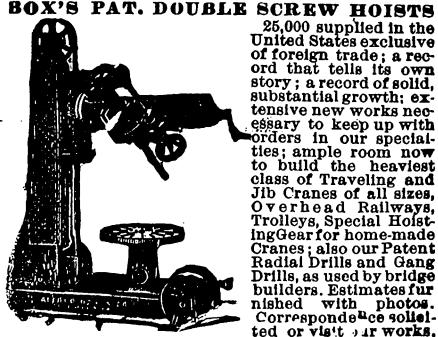
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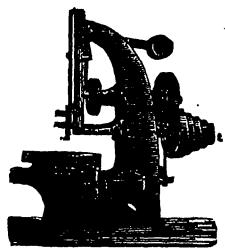
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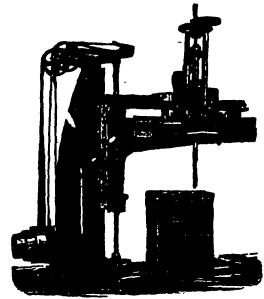
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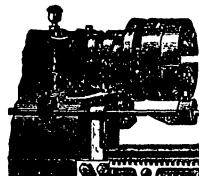
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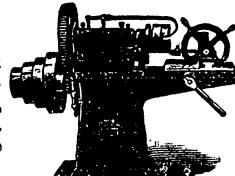


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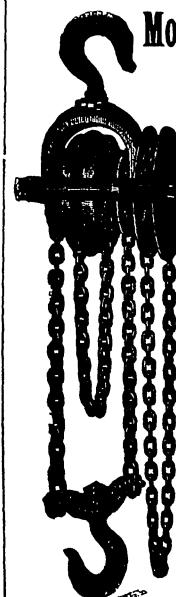
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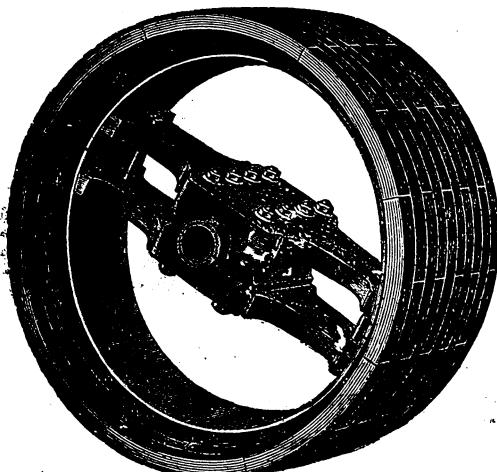
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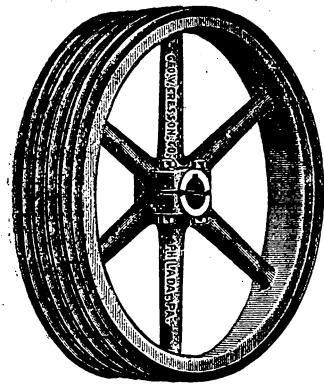
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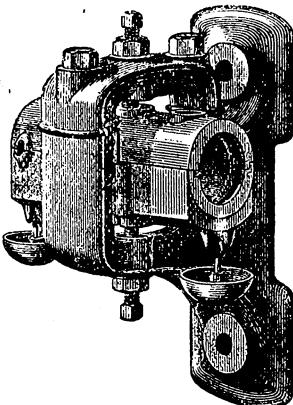
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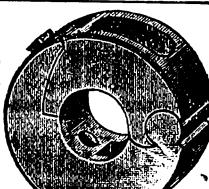
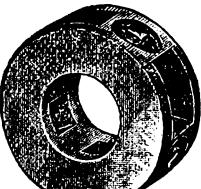
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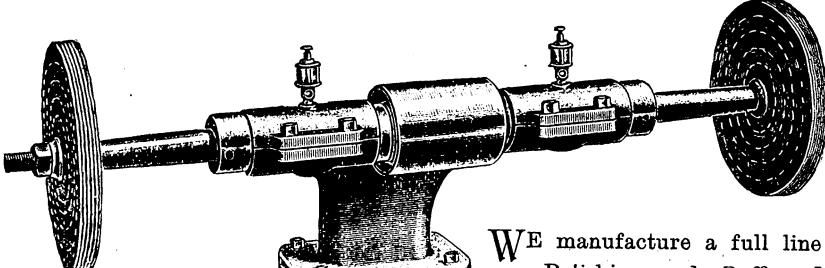


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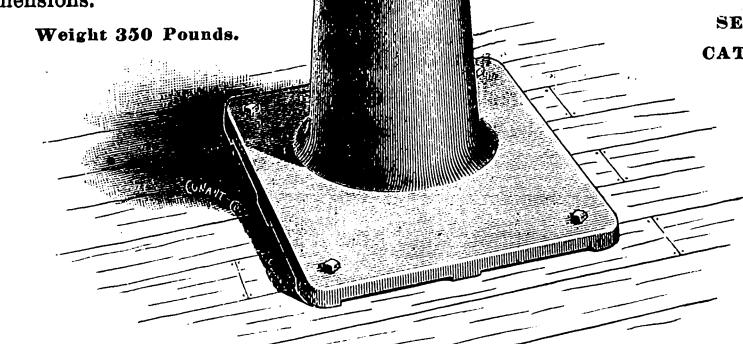
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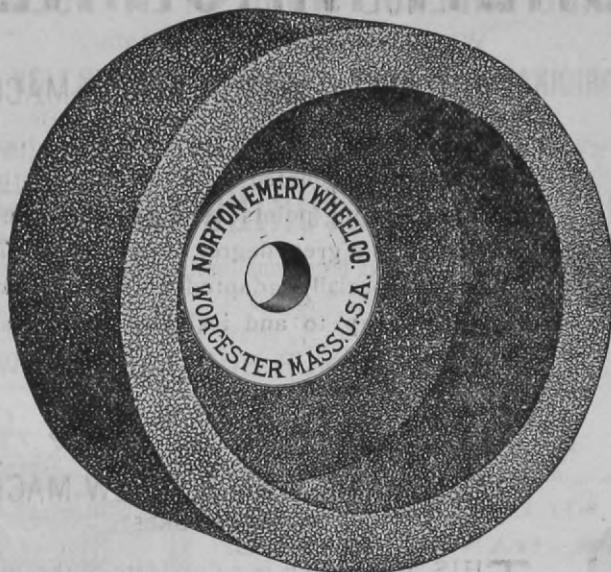
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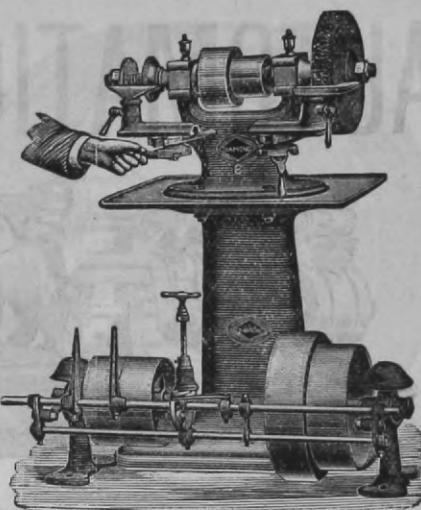


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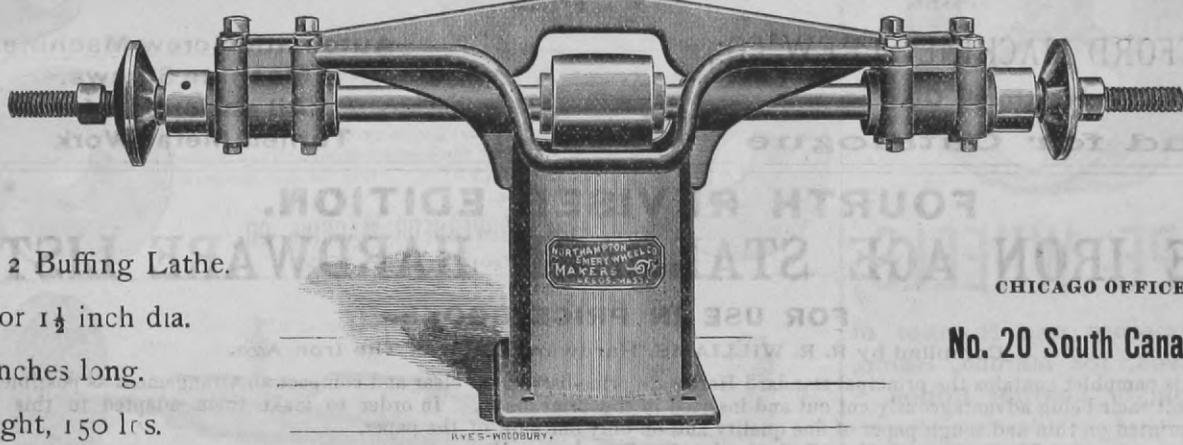
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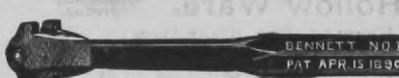
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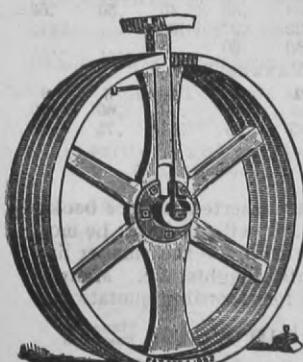
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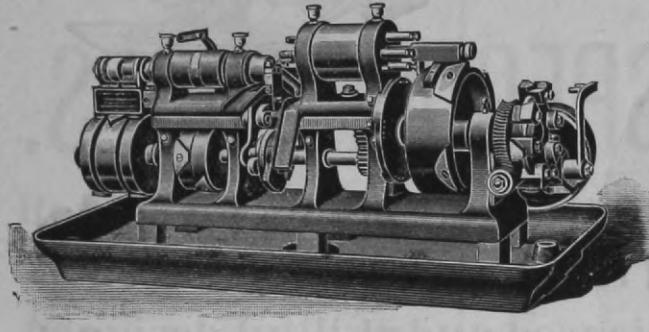
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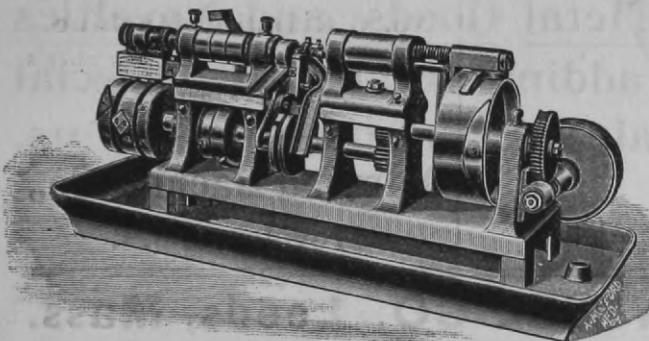


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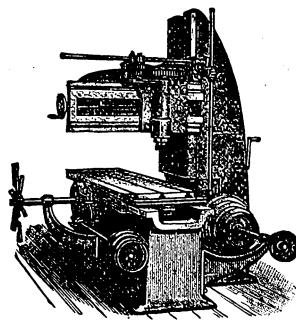
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Hofstatter's Patent Hair Picking Machine.  
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**Saves  
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Names.**

The Scattergood  
Time Record and  
Pay Roll Book.  
(Pat. Oct. 13, 1891.)  
Address for Circular to  
THE SCATTERGOOD CO.,  
Laurel St., Philadelphia.

**PATTERN LETTERS**  
For Iron and Brass Castings.  
Various Sizes and Styles.  
Heber Wells, 157 William St., N.Y.

## NEW AND SECOND-HAND MACHINERY IN STOCK.

### ENGINE LATHES.

10 in. x 5 ft. Improved.  
13 in. x 6 ft. Blisdel.  
14 in. x 6 ft. Fitchburg.  
14 in. x 6 ft. Flather Taper.  
15 in. x 6 ft. Improved.  
15 in. x 6 ft. Prentice.  
16 in. x 6 ft. Pond.  
16 in. x 6 ft. Ames.  
16 in. x 6 ft. Fitchburg.  
17 in. x 6 ft. Prentice.  
18 in. x 6 ft. Flather.  
20 in. x 10 ft. Putnam.  
20 in. x 12 ft. Prentiss Taper.  
20 in. x 12 ft. Putnam.  
22 in. x 12 ft. Putnam.  
24 in. x 12 ft. Fitchburg.  
28 in. x 16 ft. Fay & Scott.  
30 in. x 16 ft. Perkins.  
34 in. x 8 ft. Putnam.  
35 in. x 15 ft. Hewes & Phil.  
36 in. x 18 ft. Improved ed.  
48 in. x 20 ft. Fitchburg.

### BRASS LATHES.

15 in. x 5 ft. Turret Fox.  
18 in. x 6 ft. Cabinet Fox.  
**SCREW MACHINES.**  
Nos. 1, 2 and 3 Improved with Wire Feeds.

### MILLING MACHS.

"Universal," Improved,  
"Tool Room Size."  
"Universal," Improved,  
"Large size."  
Standard Sizes, Plain, with  
Auto. Feeds and Arms.  
Brown & Sharpe No. 6  
Plain.

### BRIDGE AND BOILER PNEUMATIC RIVETERS.

"Allen's" latest patterns.  
60 in. for Boiler work.  
25 in. for Bridge work.  
34 in. for Bridge work.  
**MISCELLANEOUS.**  
Acme 1 in. Bolt Cutter  
with Dies and Taps.  
Slotters 10 and 18 in.  
Ferris 100 lb. Frlc. Drop.  
Boring and Turning Mill.  
38 in. Two Heads.

**J. J. McCabe,**

14 Dey Street, - New York,  
Successor to E. P. BULLARD'S N. Y. Machinery  
Warerooms.

## New and Second-Hand Machinery.

1 Schrimmer Wood Carver. Nearly new.  
1 20 1/2 in. Leffel Water Wheel. Second-hand.  
2 35 in.  
1 Eureka Smutter. Nearly new.  
1 No 3 Diamond Water Grinder. New.  
1 No. 2 " " "  
1 H. B. Smith Blind Slat Tenoner. Second-hand.  
1 20 in. Clement Pony Planer. Second-hand.  
1 24 in. " Buzz "  
1 30 in. " Gauge Lathe. "  
1 Two Spindle Graham Shaper. "  
2 13 in. x 7 ft. Sebastian Lathe. New.  
2 15 in. x 7 ft. " "  
10 Wood Frame Saw Tables. Second-hand.  
1 Knapp Dovetailing Machine. Second-hand.  
1 Rowley & Hermance Three Sided Molder.  
Second-hand.  
1 Clement Rod and Dowel Machine. Second-hand.  
1 Clement Dado Machine. Second-hand.  
1 H. B. Smith Jointed Sander. Second-hand.  
1 Clement Vertical Boring Machine. Second-hand.  
1 Clement Boring and Bit Mortising Machine.  
Second-hand.  
1 Large Gas Furnace. Second-hand.  
1 35 in. Exhaust Fan. Second-hand.  
1 72 in. Fan Blower, Sturtevant. Second-hand.  
1 Clement Chair Round Machine. Second-hand.  
1 24 in. Pony Planer. Second-hand.  
This list will be changed each week.

**W. P. DAVIS**

Rochester, N. Y.

## 50 H.P. Vertical Boiler.

Second-hand, in use three weeks.

Will name price complete.  
We had two of them, but  
one remains.

**THE SCRANTON SUPPLY & MACHINERY CO.,**  
SCRANTON, PA.

## Second-hand Iron Planers and Engines For Sale.

One David Pond Iron Planer, 32 in. x 32 in. x 10 ft.  
Double Head.  
One Lucius Pond Iron Planer, 33 in. x 33 in. x 10 ft.  
One Wood, Light & Co. Iron Planer, 27 in. x 27 in. x 6 ft.  
One W. P. Davis Iron Planer, 24 in. x 24 in. x 6 ft.  
One Bement Planer, 22 in. x 22 in. x 6 ft.  
One Bement Planer, 22 in. x 22 in. x 6 ft.  
One Wm. Bishop Iron Planer, 24 in. x 24 in. x 6 ft.  
Two Bement Planers, 20 in. x 20 in. x 4 ft.  
One Belden Crank Planer, 16 in. x 16 in. x 24 in.  
One Pratt & Whitney Iron Planer, 15 in. x 15 in. x 3 ft.  
One Hand Planer, 8 in. x 8 in. x 18 in.

### ENGINES.

One 8 1/2 in. x 10 in. Armington & Sims Automatic Horizontal Engine.  
One 14 1/2 in. x 16 in. Armington & Sims' Automatic Horizontal Engine.

**L. F. SEYFERT'S SONS,**  
437-441 N. 3d St., Philadelphia, Pa.

## FOR SALE.

### 3 Steam Shovels.

7 Locomotives, Standard and Narrow.  
27 Cars, 2 and 3 feet gauge.  
11 Hoisting Engines.  
27 Steam and Centrifugal Pumps.  
5 Iron Planers.  
Engines and Boilers.

**THOMAS CARLIN'S SONS,**  
Allegheny, Pa.

### SECOND HAND MACHINERY.

#### ENGINE LATHES.

#### MILLING MACHINES.

#### DRILLS.

#### PLANERS.

#### SCREW MACHINES.

#### MISCELLANEOUS.

#### SHAPERS.

#### BORING AND TURNING MILLS.

#### DRILLING MACHINES.

#### DRILLS.

#### PLANERS.

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#### MISCELLANEOUS.

#### SHAPERS.

#### BORING AND TURNING MILLS.

#### DRILLING MACHINES.

#### DRILLS.

# Second-hand Tools.

## LATHES.

- 1 13 x 6 Pratt & Whitney Lathe.
- 1 14 x 5 Wheeler Lathe.
- 1 15 x 6 Porter Lathe.
- 1 16 x 6 Bogart Lathe.
- 1 17 x 12 Engine Lathe.
- 1 18 x 6 Putnam Lathe.
- 1 18 x 8 New Haven Lathe.
- 1 20 x 8 Porter Lathe.
- 1 20 x 10 Porter Lathe.
- 1 20 x 12 Blasdell Lathe.
- 1 21 x 8 Lodge & Davis Lathe.
- 1 24 x 12 Lodge & Davis Lathe.
- 1 30 x 28 Seliers Lathe.

## PLANERS.

- 1 22 x 22 x 4 Whitcomb Planer.
- 1 24 x 24 x 7 New Haven Planer.
- 1 24 x 24 x 8 Lodge & Davis Planer.
- 1 36 x 30 x 8 Hollingshead Planer.
- 1 36 x 36 x 8 Cove Planer.
- 1 40 x 36 x 10 Steptoe Planer.

## DRILLS.

- 1 3 ft. Batman Radial Drill.
- 1 20 in. Lodge & Davis Sliding Head Drill.

## SHAPERS.

- 1 15 in. Juengst Shaper.
- 1 18 in. Shaper.
- 1 20 in. Lodge & Davis Crank Shaper.

## MISCELLANEOUS.

- 1 18 x 6 Automatic Turret Lathe.
- 1 15 x 6 Fox Monitor Lathe.
- 1 80 lb. Long & Alstattner Helve Hammer.
- 1 16 in. Long & Alstattner Punch and Shear.
- 1 Buffalo Forge.
- 1 H. G. Plain Milling Machine.
- 1 No. 3 Garvin Miller.

**The Lodge & Davis  
MACHINE TOOL CO.,  
CINCINNATI, O., U. S. A.**

## SECOND-HAND MACHINERY.

- 1 Iron Planer 60 in. x 60 in. x 20 ft., 2 heads on Cross Rail.
- 1 Iron Planer 40 in. x 36 in. x 12 ft., 1 30 in. x 30 in. x 8 ft.
- 1 Iron Planer, D. W. Pond, 20 in. x 26 in. x 8 ft.
- 1 Engine Lathe 60 in. x 18 ft. New. Bargain.
- 1 Engine Lathe 24 ft. bed, 64 in. swing, D. W. Pond make, A1.
- 1 Engine Lathe 48 in. x 16 ft., raised to 60 in., Putnam make,
- 1 Engine Lathe 34 in. x 8 ft. 1 30 in. x 14 ft., Putnam.
- 1 Engine Lathe 26 in. x 10 ft., D. W. Pond make,
- 1 Engine Lathe 20 in. x 12 ft., New Haven. 1 18 in. x 8 ft., New Haven.
- 1 Drilling Machine 40 in., B. G. S. F. 1 36 in., B. G. S. F., both New Haven.
- 1 6 ton Foundry Crane, A1.
- 1 10 ton Foundry Crane, A1.
- 1 8 in. x 12 in. Holsting Engine.
- 1 14 in. x 32 in. Watts & Campbell Engine.
- 1 14 in. x 36 in. Watts & Campbell Engine.

All kinds of Iron and Wood Working Machinery.  
Lists sent. NEW YORK MACHINERY DEPOT,  
Office 178 Broadway, N. Y.

## FOR SALE.

### SECOND-HAND.

- ENGINES, Horizontal and Vertical. All types and sizes up to 2000 H.P.
- BOILERS, Vertical and Horizontal, and 3 Batteries of "Helne" water tube.
- MILLS, 3 high, 12 in., 20 in., 22 in., 30 in. and 36 in. 1 Reversing 33 in. Blooming Mill complete.
- STEAM HAMMERS. Various sizes up to 10 ton.
- SHEARS for Bars, Rails, Blooms and Plates.
- SQUEEZERS, ROLL LATHES, CRANES, GRINDING PANS, MACHINE SHOP TOOLS, &c.

- LOCOMOTIVES. Fine condition, various sizes and gauges.

"If you don't see what you want, ask for it" of

**B. M. EVERSON,**  
301 Smithfield St., Pittsburgh, Pa.

## SECOND-HAND MACHINERY FOR SALE.

Planers, Drills and Lathes, good as new, for cash.

**DIETZ, SCHUMACHER & CO.,**  
Cincinnati, O.

## WANTED.

- To furnish reasonable estimates on specialties in light metal work.
- CLARK & COWLES, Plainville, Conn.
- Manufacturers of Clock Trimmings, Rivets, Springs &c.

# Punches and Shears.

- 1 Upright Punch, 1 in. hole in 1 in. plate.
- 1 Lever Punch, with carriage,  $\frac{1}{2}$  in. x  $\frac{1}{2}$  in.
- 1 Multiple Punch, very fine.
- 1 Heavy Punch and Shear, combined.
- 1 Medium Punch and Shear, combined.
- 1 Punch or Shear, interchangeable.
- 1 Lever Plate Shear, cuts 1 in. plate.
- 1 Lever Plate Shear, cuts  $\frac{1}{2}$  in. plate.
- 1 Guillotine Bar Iron Shear.
- 1 Rotary Shear. Pusey & Jones.
- 1 Alligator Shear. 28 in. Knives.

Send for new list and prices.

**THOS. P. CONARD,**

206 Walnut Place, Philadelphia.

## FOR SALE.

### SECOND-HAND.

- CORLISS ENGINES, 36 in. dia. and under.
- PUMPS of all kinds and sizes.
- DYNAMOS, 50 to 500 light capacity.
- BOILERS, (Stationary), 4-150 H. P.
- LOCOMOTIVE BOILERS, 20-250 H. P.
- AIR COMPRESSORS. (6 Sizes.)
- ROCK DRILLS,  $\frac{1}{2}$  in., 5 in. dia.
- ICE MACHINES, 2 or 15 tons each.
- HOISTING and DREDGING ENGINES, 10-500 H. P.

### TANKS, Round, Square, Closed and Open.

Write for what you need to

**MARVIN BRIGGS,** 12 Broadway, N. Y.

- DOUBLE CORLISS CONDENSING ENGINE, 600 H. P., One 15 inch by 42 inch Corliss Engine, 125 H. P., Double Automatic Engine, 350 H. P., two 100 H. P. Phoenix Automatic Compound Engines, 45 and 5 H. P. Westinghouse Engine, one 80 H. P. Beck Engine, one 7 x 7 Southwick Automatic Engine, one 4 H. P. Otto Gas Engine, 100, 200, 300 and 500 H. P. Feed Water Heaters, 30 to 100 H. P. Return Tubulars, 70 H. P. Locomotives, 60 H. P. Vertical Boilers, good for 100 pounds.

FRANK TOOMEY, Office 131 N. 3d St. Ware houses—974 to 980 Beach Street, 159 to 161 Canal Street, Philadelphia.

### SOME BARGAINS HERE.

- 1 Hendey Shaper, 16 in. stroke, imp. vise.
- 1 14 x 6 Screw Cutting Engine Lathe, New.
- Pattern Makers' W. Lathe, 7 ft. Bed, \$40. New.
- 2½ Hendey Cutting-off Machine, New.
- 44 in. C. & D. Resaw. Fine condition.

Radial Drill, 5½ ft. arm.

Axle Cutting-off Machine, Double Head, cut  $\frac{1}{2}$  dia. Quantity 20 hand Dodge Pulleys, Cheap.

Safety Construction Company's combined Trap and Pump.

And other machinery, new and second hand. Write for prices. **Machinists' Supply Company**, 39, 41 and 43 Central Ave., Rochester, N. Y.

## A LARGE ADDITION TO OUR STOCK OF CORLISS ENGINES.

Also HIGH SPEED, Etc.

### SEND FOR CATALOGUE.

Corliss—26 x 49, 28 x 38, 30 x 72, 10 x 20. Several large sizes guaranteed, viz.: 18 x 48, 23 x 48, 28 x 48, 30 x 48, 26 x 60. Many other sizes on hand. Porter-Allen 11 x 16 and other High Speeds. An assortment of Horizontal Tubular Boilers, Large Duplex Fire Pump, Brennan Crusher, Platform Scales, Burr Mill, Bogardus Mill, etc., etc.

**G. M. CLAPE,** 74 Cortland St., N. Y.

## FOR SALE.

20 Arc Light U. S. Electric Lighting Co. Dynamos. 6 Hockhausen Dynamos.

100 Arc Lamps

2 Double Holsting Engines.

2 Large Ferracute Circular Shears.

1 Bennett Air Compressor, 18-20 x 30.

3 Steam Fire Engines.

1 50-ton Track Scale.

230 New Steel Electric Car Wheels.

**WALSH'S SONS & CO.**  
260-264 Washington St., Newark, N. J.

Dealers in Scrap Iron, Metals, Machinery, etc.

## WE WANT TO BUY SCRAP,

Iron or Steel Rails,

Busheling Scrap,

Bridge Material, &c.

Will pay spot cash for the above in carload lots.

**G. H. SIBELL & CO.,**

Manhattan Building, Chicago.

## SECOND-HAND MACHINE

### TOOLS.

#### ENGINE LATHES.

- 16 in. x 8 ft. Perkins, Taper.
- 16 in. x 8 ft. Blasdell.
- 18 in. x 6 ft. New Haven.
- 18 in. x 6 ft. Bradford.
- 18 in. x 8 ft. Blasdell.
- 18 in. x 8 ft. Wamesit.
- 18 in. x 10 ft. Blasdell.
- 18 in. x 9 ft. D. W. Pond.
- 20 in. x 6 ft. Ballard.
- 24 in. x 12 ft. Geo. Gage.
- 28 in. x 12 ft. Field.

#### PLANERS.

- 16 in. x 16 in. x 3 ft. Walker Bros.
- 20 in. x 20 in. x 5 ft. Ames.
- 22 in. x 22 in. x 4 ft. L. W. Pond.
- 24 in. x 24 in. x 6 ft. Whitcomb.
- 24 in. x 24 in. x 5 ft. Putman.
- 28 in. x 28 in. x 7 ft. New Haven.

#### SHAPERS.

- 10 in. Juengst Crank.
- 10 in. Wood & Light Traverse Head.
- 18 in. Putnam Traverse Head.
- 24 in. Hendey Friction.

#### SPLANERS.

- No. 1 Garvin Screw Machine.
- No. 2 Garvin Automatic Tapper.
- No. 4 Stilevant Blower.
- Several Wood Working machines.

#### SPLANERS.

- 3 in. Squaring Shear.
- 14 ft. Power Draw Press.
- 250 lb. Gould & E. Drop Press.
- No. 2 Garvin Cutter and Drill Grinder.
- No. 3 Slate Marking Machine.

#### SPLANERS.

- No. 2 Garvin Automatic Tapper.
- No. 4 Stilevant Blower.
- Garvin Wire Spring Collier.
- Several Wood Working machines.

Also a large number of other machines. Write for complete list and detailed description.

## THE GARVIN MACHINE CO.,

Laight and Canal Sts., New York.  
Also 51 North 7th St., Philadelphia, Pa.

## FOR SALE.

- Baker Blowers, Nos. 3, 4, 5, 5½, and 7½.
- Root Blowers, Nos. 1, 2, 3, 5, 6 and 7.
- Worthington Duplex Pump, Compound, 25 in. x 43 3-0 in. x 9 ¾ in. x 36 in., equal new.

- D. W. Pond Planer, 26 in. x 26 in. x 8 ft., equal new.
- Niles Boring and Turning Mill, 37 in., equal new.

- 9 Hewes & Phillips Lathes, 12 in. to 21 in.

- Numerous Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, Hoisting Engines, &c., cheap.

- C. R. BIGELOW, 45 Dey St., New York City.

## MACHINERY FOR SALE.

- Planer 28 in. x 24 in. x 7 ft. New.
- Drill Press, 40 in. swing. New.
- Engine Lathe, 24 in. x 25 ft. bed. 2d hand.
- Root Blowers, Nos. 1, 2, 5 and 6. 2d hand.
- Haskin Vertical Engine, 9 x 9. 2d hand.

- Improved 36 in. Band Saw. New.

- Vertical Boiler, 40 H. P. 2d hand.

- Open-die Bolt Cutter  $\frac{1}{4}$  to  $\frac{1}{2}$  in. 2d hand.

- Write us before buying. **COOKE & CO.**

- Machinery and Supplies, 163 and 165 Washington St., New York.

## FOR SALE.

- Two Double Deck Boilers, 40 H. P., Cheap.
- Iron Tanks, Square, 4 x 4 x 6, 4 x 4 x 8, 4 x 5 x 11.
- Cylinder Boilers and Flues from 8 in. to 38 in. diameter, for stacks and water. Two Radiators.

- 25 H. P. Engine and Boiler, Horizontal. 25 H. P. Locomotive Boiler, Iron Columns, several sizes.

- One Lathe, Blow-offs, all sizes.

- ROBERT M. CUNLiffe.

- Successor to Bussenius & Cunliffe,

- 1140 and 1142 Washington Ave., Philadelphia.

## A Question of Changing these Articles into Money.

- A 50 H. P. 13 in. x 24 in. "Wilbraham" Slide Valve Engine in complete order at \$270.

- A 250 H. P. 24 in. x 60 in. Slide Valve Engine with 10 ft. Band V. heel at \$850.

- A 10 H. P. 6 in. x 9 in. Vertical Engine at \$60.

- One 60 H. P. Horizontal Tubular Double Riveted Boiler with stack and entire fixtures at \$275.

- One 35 H. P. Vertical Tubular Boiler 48 in. x 10 ft. double riveted, A1, at \$215.

- One 12 H. P. Upright Tubular Boiler at \$85.

- One Polishing Tumbler, Mounted and Geared, with pulleys, size barrel 22 in. x 4 feet, intended for small castings, at \$60.

- One "Peck" Drop Hammer and Lifter, 200 lbs., at \$85.

- One Universal Milling Machine, old style, at \$100.

- One Duplex Steam Pump, 1 1-2 in. suction, at \$30.

- Lot Lathe Drip Pans at \$3.00 each.

## G. W. SCHULTZ & CO.,

308 Walnut St., PHILADELPHIA.

## Special Notice.

For some time past Joseph Rodgers & Sons, Limited, have been annoyed by Pocket Knives being put on the market stamped "Rodgers' Pattern" on blades. They are advised that this stamping is a clear infringement of their rights. Notice is, therefore, hereby given that any parties found selling knives so stamped will be prosecuted.

ALFRED FIELD & CO., Sole Agents

JOSEPH RODGERS & SONS, Limited.

New York, November 1, 1894.

**SECOND-HAND MACHINERY.****ENGINE LATHES.**

10 in., 11 in., and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & M. 15 in., 16 in., 18 in., 19 in., and 20 in. Swing, 6 and 8 ft. Bed Lathes, Dustin, Pond, Young, Fifield and Bullard. 24 in., 26 in., 28 in., 32 in. and 36 in. Swing, 10 ft., 16 ft. and 18 ft. Bed Lathes, Fifield, Dustin, Blasdell and Perkins.

**PLANERS.**

1 17 in. x 17 in. x 30 in. Hand Planer. 1 16 in. x 16 in. x 3 ft. Crank Planer. 1 17 in. x 17 in. x 3 ft. L. & M. Planer. 1 20 in. x 20 in. x 4 ft. L. & M. Planer. 1 24 in. x 24 in. x 6 ft. Pease Planer. 1 27 in. x 27 in. x 5 ft. White Planer. 1 60 in. x 60 in. x 22 ft. Heavy Planer with 4 heads. 1 60 in. x 60 in. x 22 ft. Heworth, 1 head. 1 8 ft. Boring and Turning Mill with pulley attachment.

**DRILL PRESSES.**

2 20 in. Drill Presses, Prentice & Davis. 1 20 in. x 36 in. Gap Lathe. 3 Slant Drills, 1 one-spindle, 2 two-spindle. 2 Pratt & Whitney 1 and 2 spindles. 6 Post Drills. 1 50 in. Heavy Geared Post Drill. 1 each No. 2, 3 and 4 Garvin Gang Drills.

**SHAPERS.**

15 in. Stroke, Smith. 15 in. G. & E. Make. 17 in. and 24 in. Chase & Hendy.

**SPEED LATHES.**

10 in., 12 in. and 14 in. Swing, 3, 4 and 5 ft. Beds, Garvin and Spencer.

**ALSO LARGE STOCK NEW TOOLS.**

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1000 tons 60 lb. Steel.	50 tons 35 lb. Iron.
150 " 60 lb. "	150 " 30 lb. "
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40 tons 40 lb. Iron.	20 " 36 lb. 4 in. Johnson Girder Rails.
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27 different gauge second-hand locomotives.	

J. H. RICHARDSON & CO.,  
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**OLD RAILS  
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A fine business opportunity for a live business man or two partners who have \$25,000 to invest in a first-class, old, well established and well located jobbing and retail hardware business, which did not lose money last year. Stock is well assorted. Good location in large Eastern City. Reasonable lease of premises can be continued. This will bear full investigation. Parties who can command above amount of capital address

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**FOR SALE.**—To close an estate, on account of death of principal. An old and well established jobbing and retail hardware business, located in one of the largest manufacturing cities in the State of California. The best location in the State outside of San Francisco for a jobbing business. Stock is well assorted and consists of shelf and builders' hardware, mechanics' tools, bar and sheet iron, etc. Will inventory about \$40,000. Terms and statements to principals only. Address "A. B. C.," Box 104, office of *The Iron Age*, 96-102 Reade St., N. Y.

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By a thoroughly equipped general foundry and machine works, some specialty to manufacture in the machinery line. Heavy machinery preferred. Address

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To buy for cash, first-class second-hand Engine Lathes, Planers, Drill Presses, Shapers, Milling Machines, Etc., Etc. Address

THE  
FOSDICK & PLUCKER  
MACHINE TOOL  
CO.,  
Cincinnati, Ohio.

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J. H. HILLMAN, Manager,

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Offers for sale at very low prices BESSEMER STEEL WORKS; STRUCTURAL STEEL MILLS, also STEEL MILL FOR ROLLING BARS AND COLD ROLLING, 2 BLAST FURNACES, RUSTLESS IRON WORKS, GLASS WORKS, FOUNDRY, PLANNING MILL, BRICK WORKS, and numerous other manufacturing interests and large quantity of very desirable Coal Properties improved and unimproved.

**Dealers in Coal and Iron Lands.****Examination and Reports**

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**WANTED.**

Price and description of 30-inch guage Mine Locomotive. Must be in good condition.

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The old established Iron, Steel and Storage business conducted for thirty years or more by the late Albert T. Converse, in Norwich, Conn.

Since Mr. Converse's decease the business has been conducted by the Administrator at the old location, No. 23 Commerce St.

The property for sale consists of Warehouse containing store and three lofts, with wharf property, office and wareroom furniture and fixtures and stock of Iron and Steel.

The Real Estate, Fixtures and Furniture and stock of Iron and Steel will be sold all together at a low cash price, or, if not possible to do this, they may be sold separately.

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**Chicago Storage Warehouse.**

General merchandise storage, with desk room if wanted, situate in wholesale district.

Apply to  
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A manufacturer wants to add to his line some new specialties that will sell to the Jobbing Hardware, Saddlery or Woodenware Trade. Address "JOB-BING TRADE," office of *The Iron Age*, 96-102 Reade Street New York.

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**PORTABLE STEEL RAILROAD CULVERTS;** they are unique, practical, strong, cheap and just the thing to use when building ELECTRIC AND STEAM RAILROADS: they fill a long-felt want in Railroad Construction. This invention is also admirably adapted for Highway and County Road Bridges. Send for descriptive circular.

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One No. 5 Root Blower, in use about two years. In perfect condition. Also one Cupola Shell, 72 inches in diameter, 45 feet high, 11½ feet to bottom of charging door.

MENARD MANUFACTURING CO.,  
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A valuable United States patent. Can be manufactured at a small cost and sold for a good price to dealers in machinists' tools, hardware manufacturers, clock manufacturers, &c. Nothing of the kind on the market. Will be sold cheap and full particulars given.

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**Letters Patent No. 527,668,**  
Oct. 16th, 1894.

**Metallic Tie.—Railroad.**

The Patentee, unable to handle, desires to sell at once. Reasonable price. Address

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**Upright Boring and Turning Mill,** 38 in. swing, with two heads, for boring, turning and facing. Latest pattern. Good as new.

**Horizontal Boring and Facing Machine,** for cylinders and large frames. Revolving bar 8 in. diameter. Bores to center of 54 in.

**Upright Turret Borer,** "Brown & Sharpe's" make, for boring and facing pulleys, etc., up to 36 in.

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## Heavy Pressure PUMPS FOR SALE CHEAP.

Two pairs of

## Worthington Compound Condensing Press. Pumps

14 in. x 24½ in. x 3½ in. x 18 in. stroke. Adapted to 2000 lbs. pressure per square in. In good order. Complete, with condensers.

The United States Projectile Co.,  
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One Brown & Sharpe No. 2 Full Automatic Screw Machine complete. Good as new.

One 66 in. swing 6 ft. table Bement Horizontal Boring machine complete. First-class condition. Will be sold at low prices. Address

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## FOR SALE.

A 4 Horse Power Gas Engine in good running order, now in use by us at our stores.

EDWARD DARBY & SONS,  
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## A Modern Rolling Mill

admirably adapted and situated for furnishing, at lowest cost of production, brass, copper and other metals, in sheets, rods and wire, are desirous of opening negotiations with some consumer and manufacturer of these goods who is anxious to extend his business and employ more capital. Address

"MODERN MILL,"

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## HARDWARE and AGRICULTURAL BUSINESS FOR SALE.

A good opening for any one wanting to go into business. Wanting to get out of business I offer my entire stock of Hardware and Agricultural Implements for sale. This is a good opening for a live man. The business is well established and is a money maker. A better opening cannot be found anywhere. The right kind of a man can work up a large trade. The stock can be reduced to suit the purchaser. Good reasons for selling. Address A. D. HOGENDOBLER, Osborn, Ohio.

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Western Manufacturers will buy Staple Hardware and House Furnishing Goods to sell with their own line. Special prices expected. Want catalogues and pushing. Address "WESTERN MANUFACTURERS," office of *The Iron Age*, 96-102 Reade St., N. Y.

## Standard Scale and Fixtures Co.,

DEALERS IN AND JOBBERS OF Standard Scales, Warehouse Trucks, Baggage Barrows, Wheelbarrows, Car Movers, Money Drawers, etc., etc.

Standard Scale & Fixtures Co.,  
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ST. LOUIS, MO.

J. A. COLEMAN,  
Author Coleman's Mechanic's Liens in Illinois  
Attorney at Law,  
82 Hartford Building, Chicago.  
MECHANIC'S LIENS EXCLUSIVELY.

## TO LET FOR MANUFACTURING USES.

At South Easton, Pa., on line of Lehigh Valley Railroad and on Lehigh Canal. Sidings in buildings. Electric light. Electric street railway. One main 2-story building, 275 ft. x 45 ft. Steam Engine, Shafting and complete appurtenances for first-class factory or machine shop. One high 1-story building, 80 ft. x 45 ft., Cement floor. One 2-story building, 35 ft. x 45 ft., ground floor suitable for smith shop, etc.

These buildings were erected for galvanizing and barb wire plant, and more recently, for several years, have been in the occupancy of The National Switch & Signal Co. They form part of the plant of The Stewart Wire Co., being separated from its main plant by the Lehigh Canal. Affords a most desirable opportunity for industry using wire in any of its forms and is an exceptionally fine location for manufactory of any character.

Will be let in whole or in part, with or without the adjacent thoroughly equipped and complete Wire Drawing Mill, steam and water power, situated on same side of Canal. For further particulars address

THE STEWART WIRE CO.,  
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## TO RENT.

A comfortable and convenient office, nicely carpeted, steam heat and gas, including desk and office furniture, on second floor, No. 2½ Murray St. Also floor space if desired. Cheap to the right party.

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## FOR SALE.

One of the oldest established retail and wholesale Hardware, Stove and Plumbing businesses in Luzerne County. Situated at Wilkes-Barre in the heart of the richest coal field in America. Will sell stock reasonable and charge nothing for good will. Will either sell or give liberal lease on building, which is 23 by 104 ft., six stories high, on one of the most prominent business corners in the city. Our reason for selling is, our manufacturing business in another part of the city has grown to such proportions that we desire to devote our entire attention to same

W. B. BERTELS, SON & CO.  
186 East Market St.,  
Factory, Cor. Canal & Butler Sts.,  
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## To Manufacturer's and Hardware Dealers.

## FOR SALE.

A NOVELTY in a WEDGE for Axes and Tools with wood handles, in ten sizes. Patented, July 25th, '93. The only wedge on the market. If the handle shrinks the wedge can be driven deeper and the handle cut off flush and it will hold.

ALSO a new invention in SLIDING DOOR LATCHES, patented November 26, '89. These latches are for stable doors and gates. By turning other side up can be used as a straight gate or thumb latch. Can be made as cheap as ordinary latches.

The Wedge and Latches were ILLUSTRATED on pages 56 and 54 of *The Iron Age* of October 18th, 1894. Patents for sale or will take partner with small capital on six patents in the hardware line. Write for samples, etc.

W. H. THOMAS,  
Jenkintown, Pa.

## Special Notice

to Hardware buyers. You can buy Trowels and other tools too numerous to mention, of superior quality, at prices to suit the times. Address all communications to

CHAS. A. VAUGHN, Manufacturer,  
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## HARDWARE STORE FOR SALE.

One of the oldest established retail Hardware stores in Eastern Indiana, located in county seat of 2500 population, in the center of rich agricultural and manufacturing district. Stock in good condition. Only one other hardware store in town. Will sell reasonably. Address "L."

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## FOR SALE HOISTING ENGINES

MANUFACTURED BY

THE JOHN F. BYERS MACHINE CO.  
RAVENNA • • • • OHIO.  
WRITE FOR CATALOGUE.

## IMPORTANT AUCTION ANNOUNCEMENT.

## E. Bissell, Son & Co.,

AUCTIONEERS,

Tuesday and Wednesday, Nov. 13th & 14th,  
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At Nos. 12 Murray St. and 15 Park Place, N. Y.

## Large, Special and Unreserved Trade Sale

Of several thousand dozen Table Knives and Forks, Pocket Knives, Butcher Knives, Carvers, &c., comprising a large line of desirable patterns.

Fine Goods suitable for Thanksgiving and Holiday Trade. Also Several Hundred Dozen Silver-plated Tea and Table Spoons and Forks, extra plate on eighteen per cent. Nickel Silver.

ALSO A LINE OF

Wm. Rogers Mfg. Co. First Quality Tea and Table Spoons on eighteen per cent. Nickel Silver.

ALSO A LINE OF

Rogers silver plated Medium Knives, also fine Pearl Handle Medium and Dessert Knives, Fruit Knives and Nut Picks; also a large line of Fine Carvers; also 1000 Dozen fine nickel plated Scissors and Shears; also, to close an account, 50 Fine Single and Double Barrel Breech Loading Guns, Manufacturers' Samples; also 2000 pairs Winslow's Number 0 American Club Skates, assorted 7½ to 12 inch; also by order of The Hartford Silver Plate Co.—in Liquidation—100 Lots fine Quadruple Plated Silver Ware, including Casters, Berries, Tea Sets Writing Sets, Tea Caddies, Card Receivers, &c., &c. Goods will be sold in quantities to suit Jobbing and Retail Trade.

This will be our Last Cutlery Sale for this season and will be worthy the especial attention of the Entire Trade and Department stores.

## COMPLETE SET OF

Plumber's Iron Pipe and Fitting Patterns, includes arbors, benches, flasks, &c., for sale low. Address "OWNERS,"  
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## ADOLPH BUTZE,

Manufacturers' Agent.

Railroad, Packing House and Contractors' Supplies.

AGENT FOR—

LATROBE STEEL WORKS, Locomotive and Car Wheel Tires. UNITED RUBBER CO., Hose, Packing, &c. GEO. GRIFFITHS CO., Shovels, Scoops, &c. Corrugated Galvanized and Sheet Iron, Plate, Tank and Bar Iron, Waste White Colored and Wool.

Bank of Commerce Bldg. St. Louis, Mo.

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ATTENTION! Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Send for our draft book.

THE HARDWARE BOARD OF TRADE, Ltd.,  
4 and 6 Warren street, New York.  
JAS. H. GOLDKEY, Treas.

**ALLENTOWN  
HARDWARE WORKS.**

Manufacturers of the latest and most improved Locks, Butts, Knobs, General Builders' Hardware, &c. Electro, Brass, Silver, Bronze and Nickel Plating. House Door Trimmings, Sash Locks, Sash Pulleys, Casters, Bronze and Brass Work of all descriptions. High Grade Light Gray Iron Castings, Soft, Smooth and Easily Drilled. Patented Articles a specialty. Superior Quality. Estimates furnished on application from drawings and specifications. Bronze, Brass and Composition Castings. Japanning, Metal Art Work. Common Iron Castings made to order at short notice. First Premium and Diploma awarded for the best and most artistic display of General Hardware. Fine Iron and Brass Castings and Metals by the Pennsylvania State (Bethlehem) and Allentown Fairs. Architects and Builders are invited to examine our patent new style door lock, the best, most stylish and complete manufactured. Also manufacturers of **Refrigerator Locks and Trimmings** of new, beautiful design, finish and of the latest pattern, made expressly for the coming season, without exception the best ever used on a refrigerator. Write for catalogue and full information to

P. O. Address, **ALLENTOWN, PA.**

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MACHINE CO.,**

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**IRON PLANERS.**

**EXTRA HEAVY.**

**LATEST DESIGNS.**

**MODERN IMPROVEMENTS.**

**Eclipse Shoe Stands  
and Lasts.**



Patented May 1st, 1894.

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**VALUABLE PROPERTY.**

A Grand Opportunity to Purchase a Manufacturing Plant Cheap.

**Taxes Low, Insurance Low. The Town will Offer Many Inducements.**

Henry L. Smith, Receiver of the Albany Horse Nail Company, offers for a limited time at private sale, the following:

Lot, 367 ft. x 367 ft. 9 in., upon the Bank of the Hudson River, and in addition, land under water to center of channel of river. Lot contains one main building 52 ft. by 208 ft. Slate roof, wood and iron frame, solid brick floor, office and store rooms; thoroughly equipped with steam heat, independent water supply, first-class drainage. Also one brick and iron roof boiler house adjoining main building. Main building contains one compound Duplex Engine, 200 horse-power, of the very best and latest make, with all modern appliances; 200 feet of main shafting with pulleys, cups, and all complete. Boiler house contains two 100 horse-power boilers with all modern appliances.

Everything new, foundation of engine, setting of boilers and all detail thoroughly first-class.

Location just across Albany city line on the bank of the Hudson River. Dock privileges within 75 feet, and D. & H. C. Co. branch track within 60 feet of building. No cartage. Title absolute.

Property must be sold. Correspondence solicited. Receiver will give all information, and invites inspection.

Will sell separately or with the plant the following:

Large quantity of counter shafting. Foster air pump No. 2. Sturtevant blower No. 8, noiseless, with counter shaft. Grindstone and solid oak frame, stone 6½ inch face and 6 feet diameter. Weight of stone 2026 lbs. Emery wheels with table. Two Superb oil tanks, designed to contain oil for fuel. Dimensions, 6 ft. diameter, 24 ft. long. Bumptead Heads, man hole, caulked inside and out. Perfectly tight and guaranteed under pressure of 30 lbs. All of the above absolutely new, never used, all in good condition. Also many miscellaneous tools, scales, &c., &c. All new.

Fntire plant suitable for almost any large manufacturing. Address or call upon

**HENRY L. SMITH, Receiver,**

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*Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.*

**HARDWARE SALESMAN** with an established route through the Southern States to sell a good article as a side line; salary. BOX 200, Painted Post, N. Y.

**EXPERIENCED SALESMAN** to represent a large jobbing house in Pennsylvania; must be fully acquainted with the hardware and cutlery trade and must have acquaintance in the State; write giving locality covered. Address "H. & C. TRADE" office of *The Iron Age*, 220 So. 4th St., Philadelphia.

**EXPERIENCED SALESMAN** for New York and Pennsylvania, fully acquainted in hardware and cutlery and already having an acquaintance in both States. Address "J. G. P." office of *The Iron Age*, 220 So. 4th Street, Philadelphia.

**A MAN** to do enameling; one who thoroughly understands mixing, lining and firing. Address "ENAMEL," office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

**TRAVELING SALESMAN** for special territory in every State, visiting the hardware and household goods trade, who will carry our aluminum goods as a side line. Address "MANUFACTURER," office of *The Iron Age*, 59 Dearborn St., Chicago.

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**A MECHANICAL ENGINEER**, 40 years of age, with long and large experience in the management of large business enterprises and also in estimating, contracting and purchasing, desires a position where his abilities will be appreciated. The best references can be given. Address "M. E." office of *The Iron Age*, 59 Dearborn St., Chicago.

**I DON'T KNOW** it all, but am willing to work under the instructions of my employer; am 29 years of age, married, have had twelve years' business experience with leading manufacturers, as bookkeeper, correspondent, managing clerk, etc.; have had some experience in preparing costs and estimates on light metal goods. Address "AMERICAN," office of *The Iron Age*, 96-102 Reade St., New York.

**BUYER.**—By a young man of 25, as buyer with some purchasing agency or export house; can furnish references as to ability; is at present employed but is willing to change at once. "BUYER," No. 118, office of *The Iron Age*, 96-102 Reade St., New York.

**YOUNG MAN**, 19 years of age, desires position with good hardware house; three years' experience with same; quick, accurate and neat in execution of work. College bred and can furnish the best of references. Address HUGH HAMMOND, JR., 30 E. Trade Street, Charlotte, N. C.

**TRAVELING SALESMAN**, fifteen years' experience in Eastern, Middle and Southern States, with heavy hardware, railroad and contractors' supply dealers, wishes to carry a side line on salary or commission; references exchanged. Address "C. S." Box 118, office of *The Iron Age*, 96-102 Reade St., New York.

**TO BRASS FOUNDRERS.**—A practical brass molder of many years' experience on steam and water work, plumbers' supplies and general jobbing, six years' experience in handling help, one who is willing to hustle, well up in the mixing of metal, coremaking and all the details of foundry, desires a position as foreman; location no object; references. Address "C. M. K.," Belleville, N. J.

**A FULLY COMPETENT HARDWAREMAN**, fifteen years' practical experience, for past ten years buyer and office manager of one of the largest jobbing houses in the country, a thorough accountant and correspondent, desires to connect himself with substantial heavy hardware from A to Z; references unexceptionable. "MANAGER," P. O. Box 2766, N. Y.

**A YOUNG MAN** of 7 years' experience in hardware, stoves and house furnishing goods wishes to correspond with good manufacturing firms with view of representing them in Northern Ohio; Al references furnished. Address "H. E. B." Sta. F, Cleveland, O.

**EXPERIENCED PIG IRON SALESMAN**, now with an established house, wishes to make a change; well acquainted with buyers in New York and New England and can command some trade; salary moderate. "S. N." Box 118, office of *The Iron Age*, 96-102 Reade St., N. Y.

**WANTED.**—A thoroughly competent book-keeper and office man; one familiar with hardware business, a good correspondent and capable of managing finances; must commence duties at once; salary \$1200 per year; only those with good business qualifications need apply. Address, giving references, D. C. WELLER, Erie, Pa.

**WANTED.**—A contractor, or iron mine operator, to work an important mine not over one hundred miles from New York; only those who are thoroughly practical and have ample responsibility need apply; answer with full particulars. "MINE OWNER" office of *The Iron Age*, 96-102 Reade St., New York.

**A MAN** competent to invent articles of mechanical hardware; one who has had experience and can show reference as to ability. Address "HARDWARE," office of *The Iron Age*, 220 So. 4th St., Philadelphia.

**A TRAVELING SALESMAN**; has had 14 years' experience as such in hardware, iron, etc., in Northwest; best of references. Address "HARDWARE," Box 2, Lake Park, Wash.

**A FOUNDRY FOREMAN** of long experience and first-class qualifications will be open for an engagement end of October; thoroughly posted in cheap methods of production either in iron or steel; highest testimonials as to ability and personal character. Address "X. Y." office of *The Iron Age*, 146 Franklin St., Boston, Mass.

**HARDWAREMAN**, 24 years old, seven years' experience, wishes position as clerk in store or to travel. BROWN, 6338 Hoeveler St., E. E., Pittsburg, Pa.

**A SUPERINTENDENT OR FOREMAN** of architectural iron work; had charge of big jobs, good rigger, derrick man and finisher; able to handle men and work according to plans; best of references. Address "E. K." Box 111, office of *The Iron Age*, 96-102 Reade St., New York.

**A SUPERINTENDENT**, by man of large experience in, and thorough practical knowledge of, steam and hydraulic machinery; also mill machinery and construction work. Address "STEAM AND HYDRAULIC," office of *The Iron Age*, 96-102 Reade St., New York.

**A CLERK OR SECRETARY** to mechanical engineer, by man who is a practical book-keeper, good correspondent and familiar with drawings and machinery. Address "CLERK OR SECRETARY," office of *The Iron Age*, 96-102 Reade St., New York.

**AGENCY WANTED**—Desire to handle the product of first-class, pushing, energetic foundry; want grey iron, brass, composition and bronze castings; will make New York headquarters if satisfactory arrangements can be made; Al references given and required. Address "FOUNDRY AGENT," office of *The Iron Age*, 96-102 Reade St., New York.

**MAN OF EXPERIENCE** in the manufacture of hardware seeks position; disengaged November 1st; understands thoroughly both iron and brass foundry in all branches. Address "METALLIC," office of *The Iron Age*, 96-102 Reade St., New York.

**A COMPETENT, ACTIVE BUSINESS MANAGER** with long experience as a rolling mill manager, wants a position; is well posted in the manufacture of plates, sheets, sections and general merchant bar iron and steel, understands how to turn out good work at lowest cost and is accustomed to purchasing all supplies. Address "R. W. A." Box 1027, office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY A THOROUGHLY experienced hardware and implement man; first-class salesman and stock keeper; can manage store and do the buying if necessary; have had four years' experience on the road; would make contract with a good firm; good references. Address L. W. VIVION, 131 Emma St., Dallas, Texas.**

**SUPERINTENDENT OR CHIEF ENGINEER**, by mechanical engineer of large and varied experience in hydraulic machinery, structural work in iron and steel, installation of plants, transmission of power, cranes, etc., thoroughly conversant with modern methods of construction and shop practice. "MODERN METHODS," office of *The Iron Age*, 96-102 Reade St., N. Y.

**A GENTLEMAN** of extensive business experience with one of the largest manufacturing concerns in the United States, would like to open correspondence with reliable parties in need of a capable man for position of trust and responsibility; unqualified references can be furnished from former employers and the leading bankers and business houses in the city where he resides. Address "CUSHMAN," No 1011, office of *The Iron Age*, 96-102 Reade St., New York.

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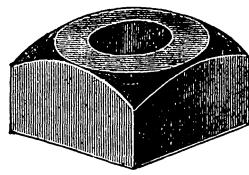
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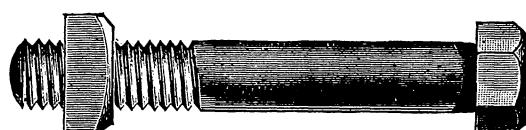
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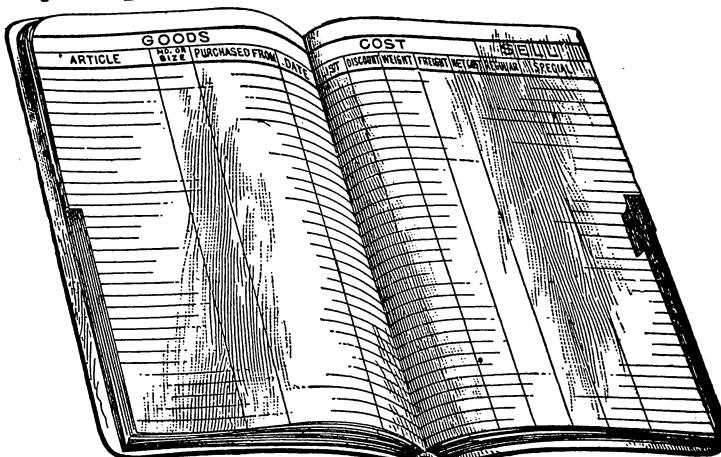
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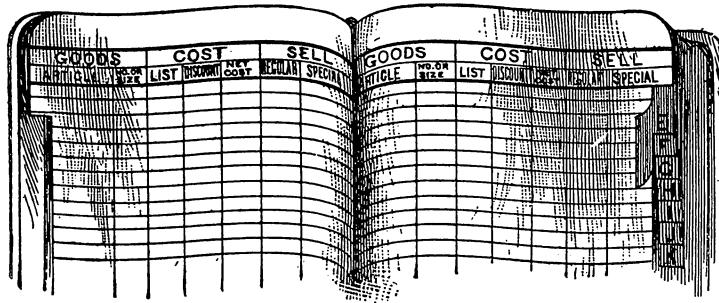
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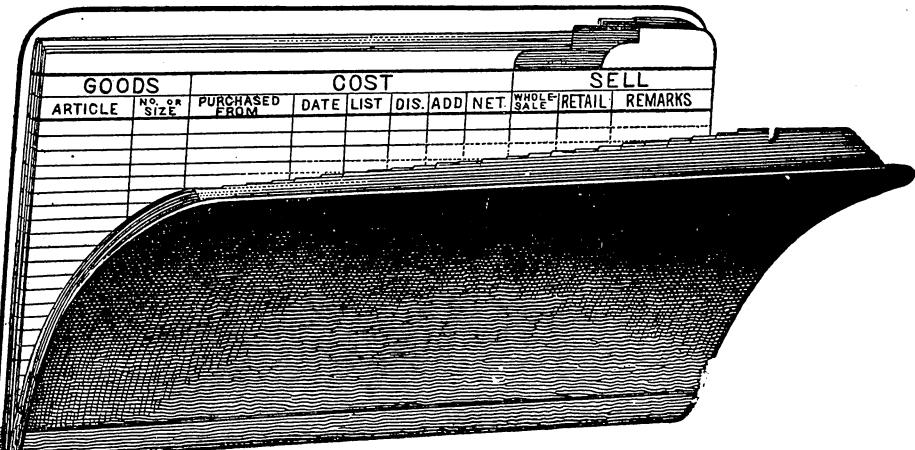
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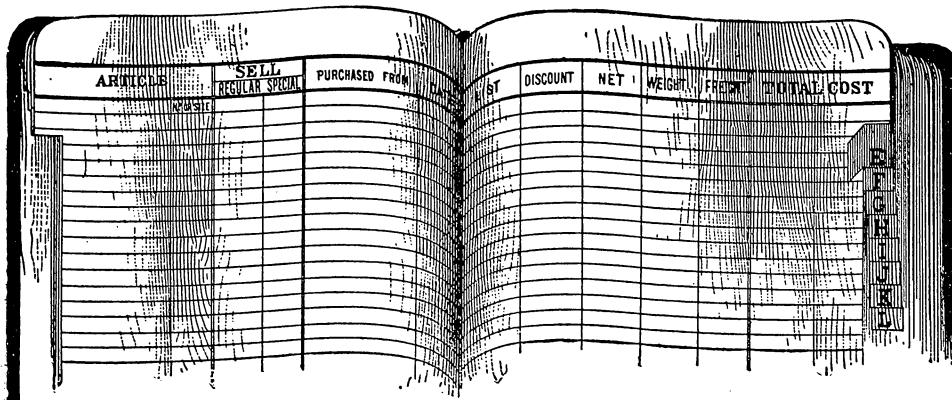
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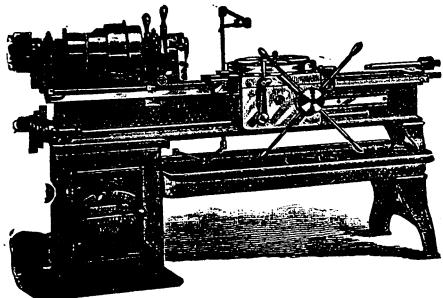


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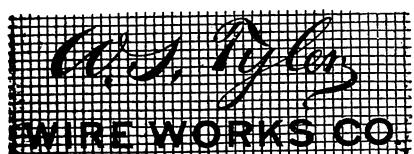
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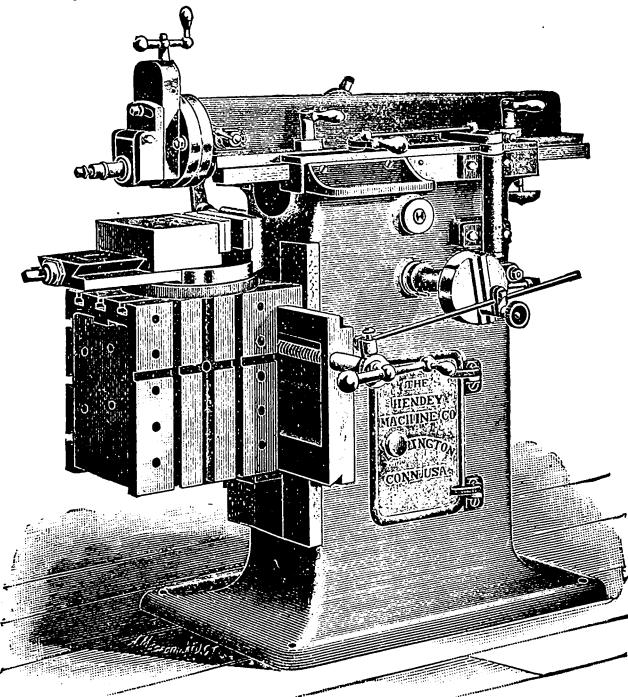
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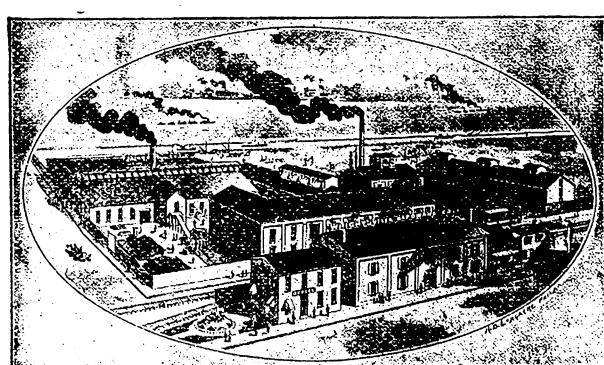
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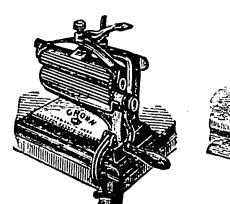
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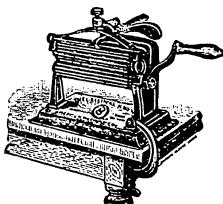
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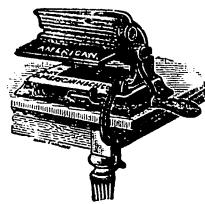
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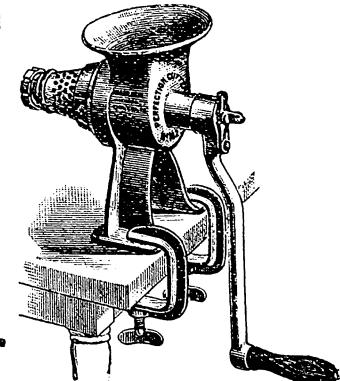
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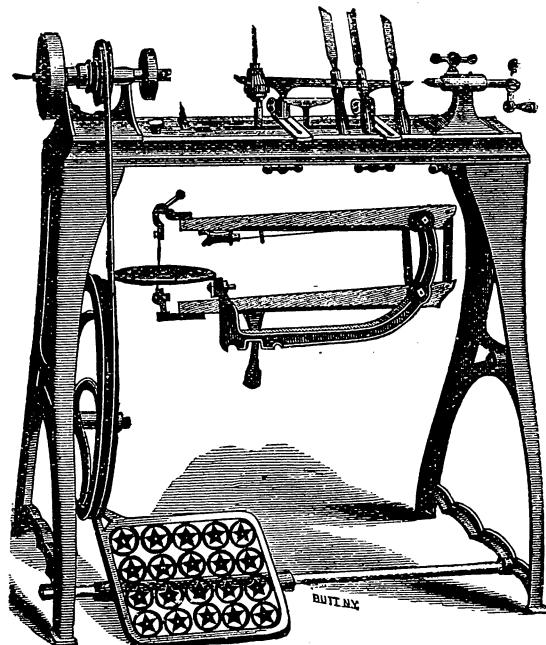


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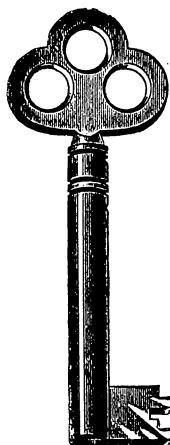
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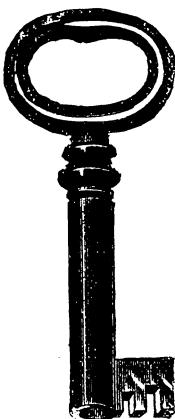
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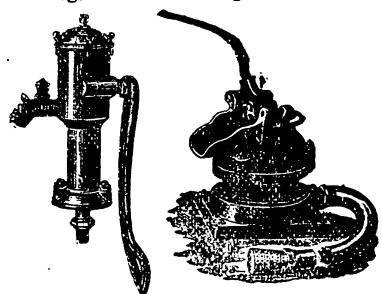
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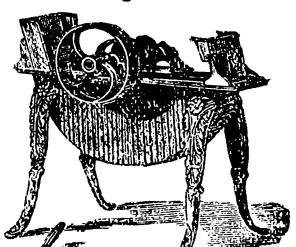
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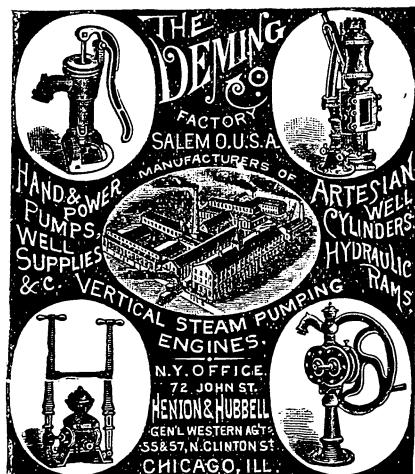


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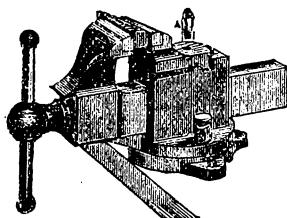


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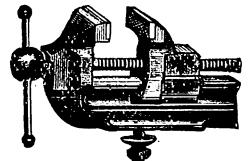
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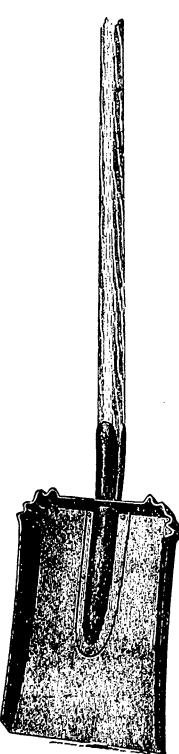
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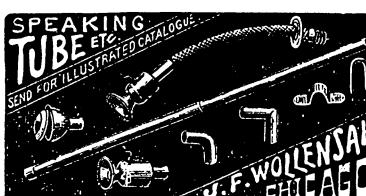
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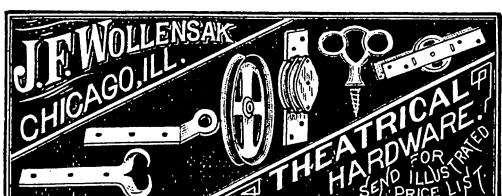


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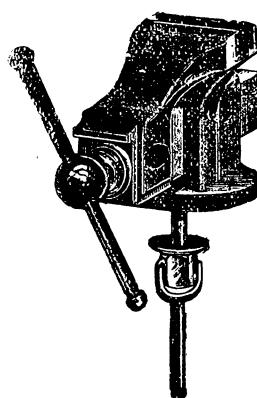
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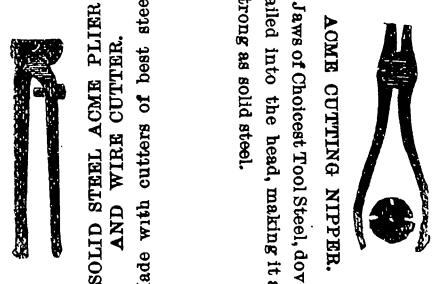
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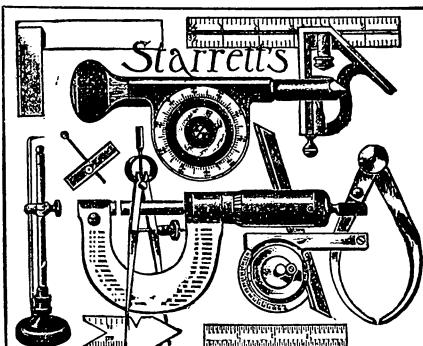
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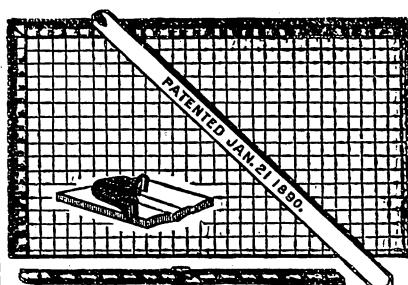
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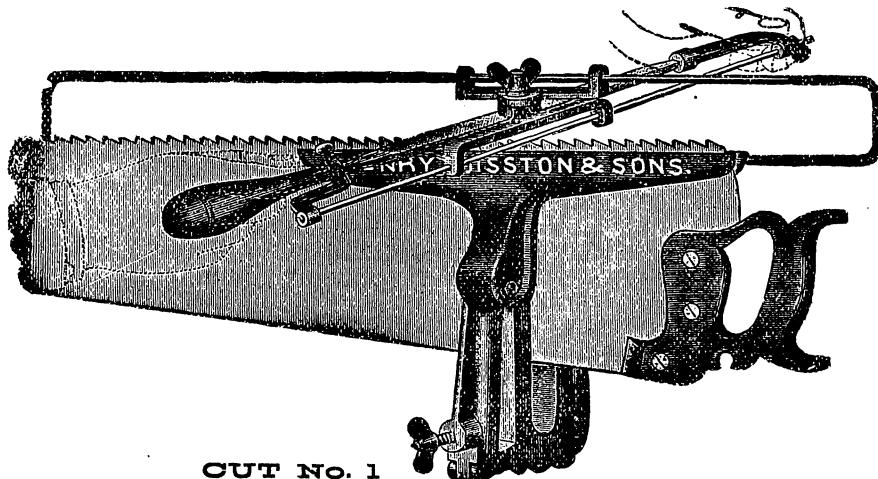


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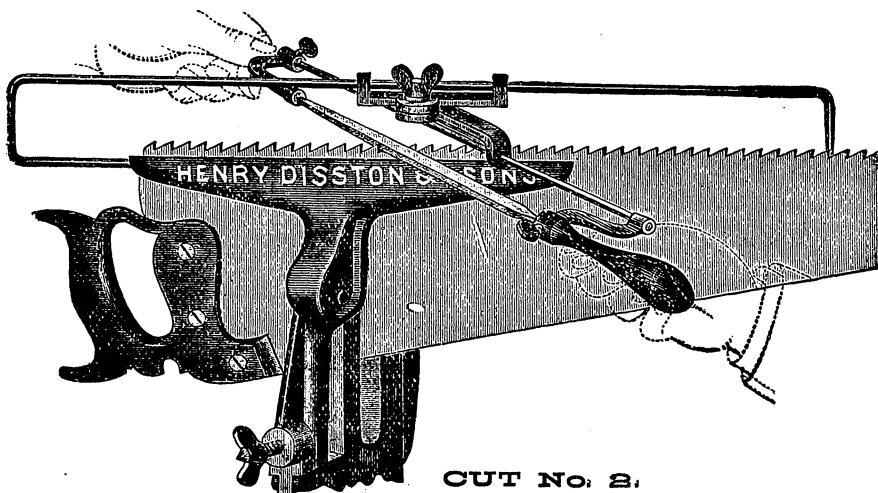
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Cut No. 1 shows a saw and the attachment in proper position for filing the first side, and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

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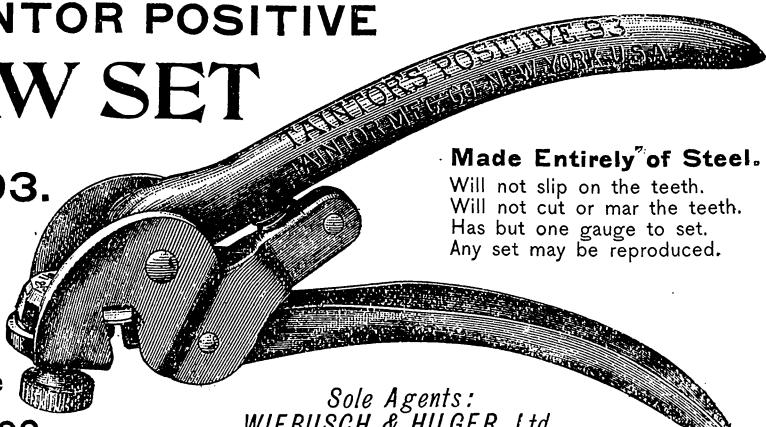
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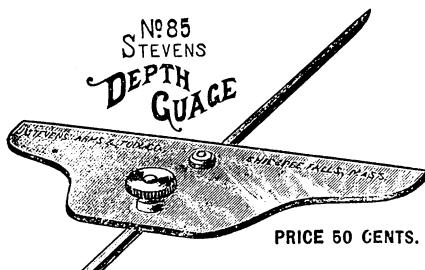
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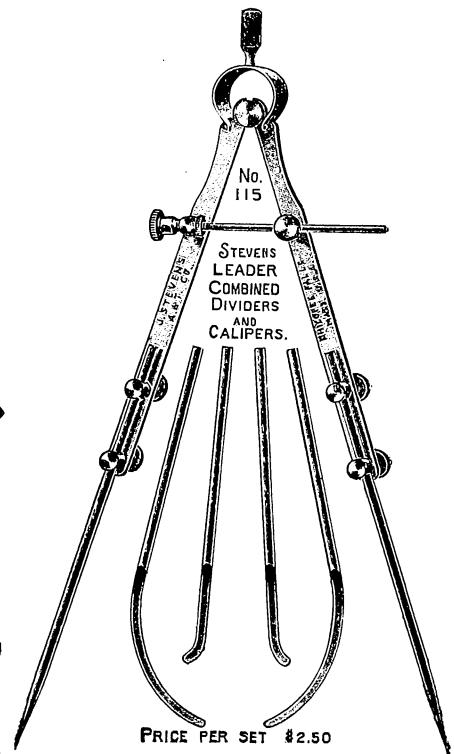


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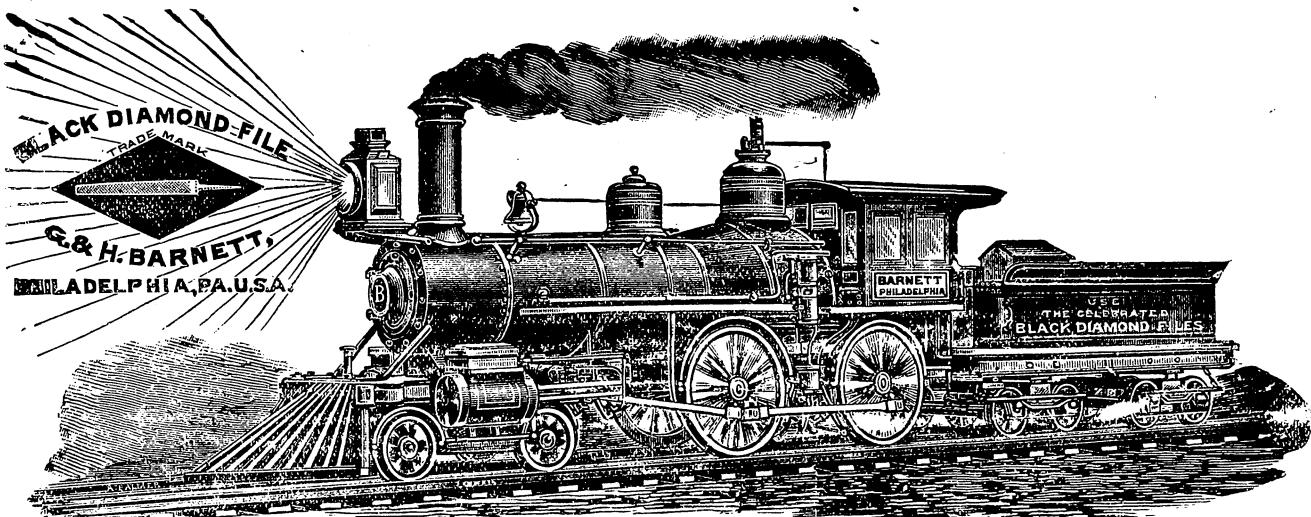
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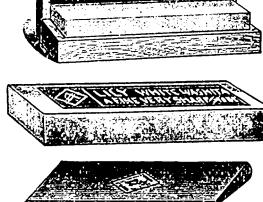
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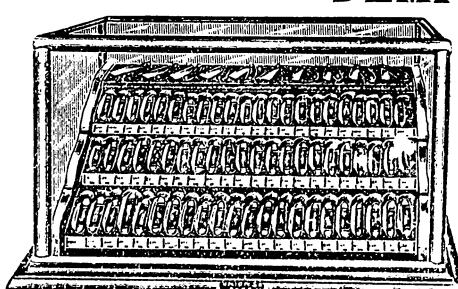


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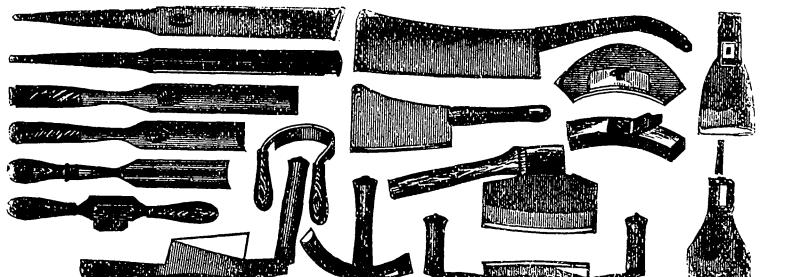
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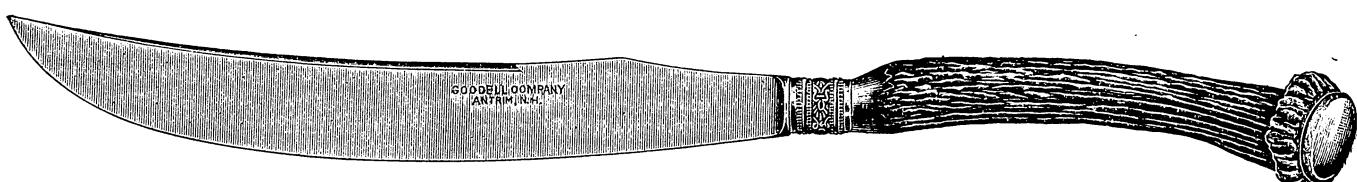
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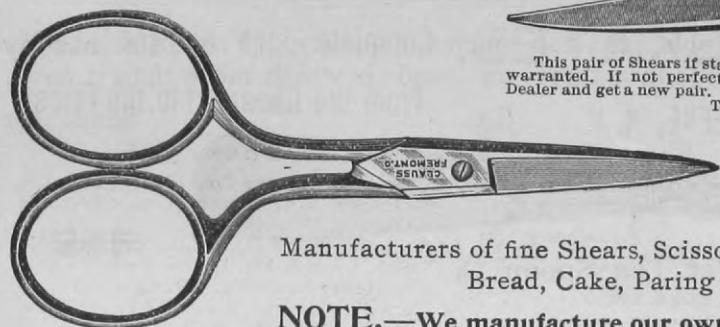
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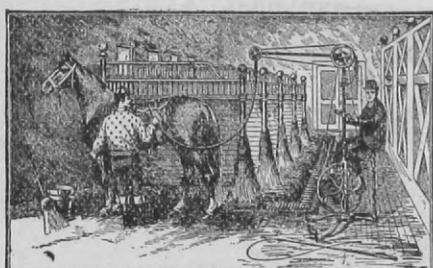
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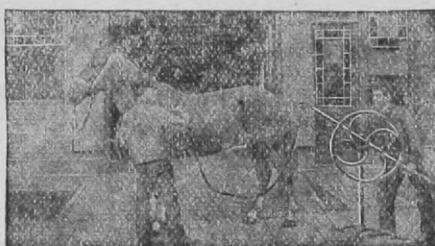
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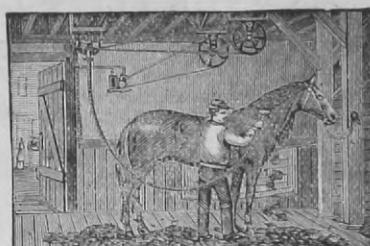
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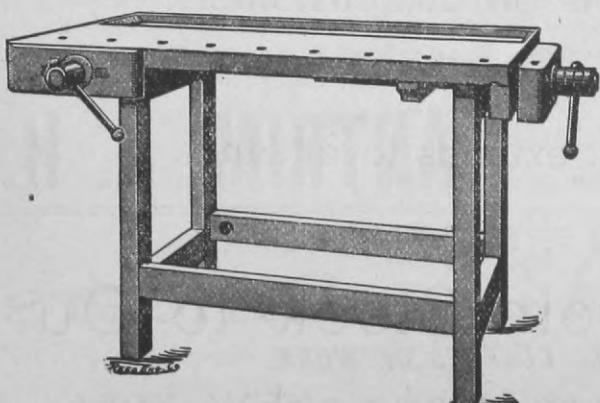
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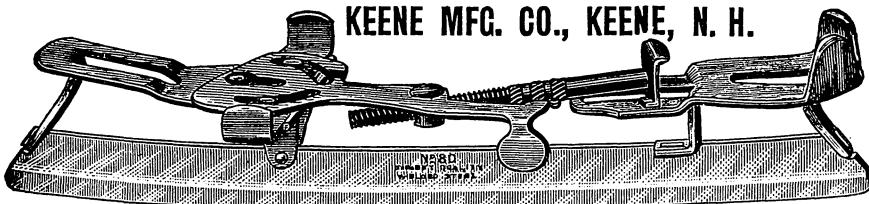
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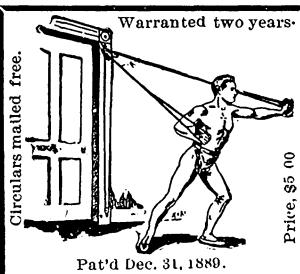
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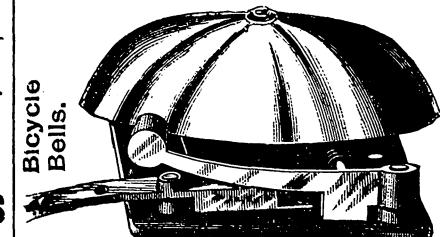
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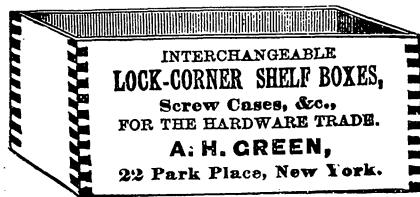
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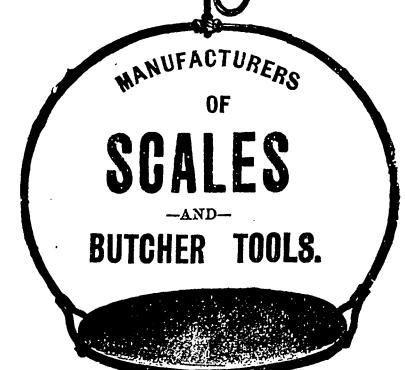
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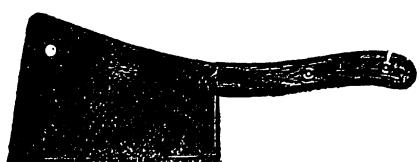


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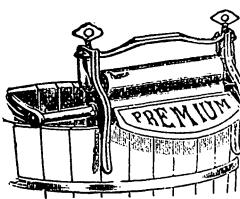
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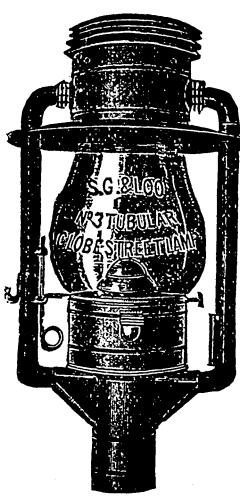
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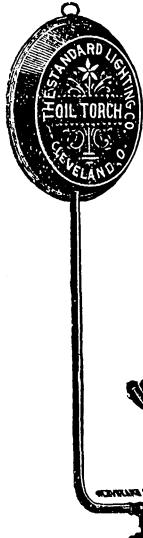
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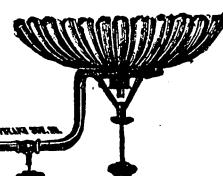


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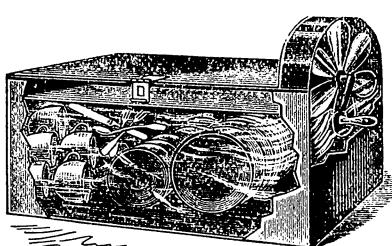
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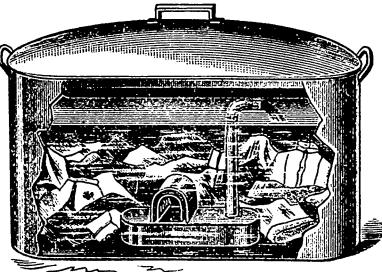


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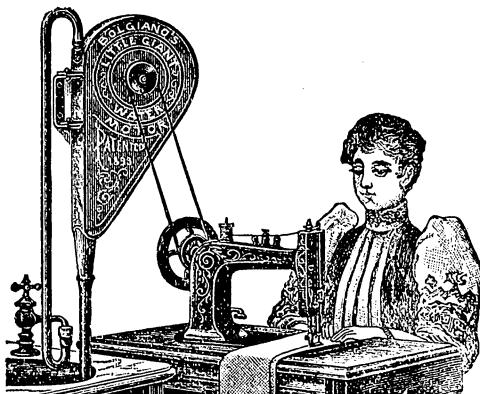
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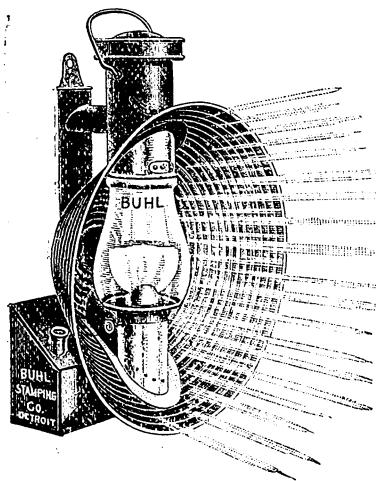
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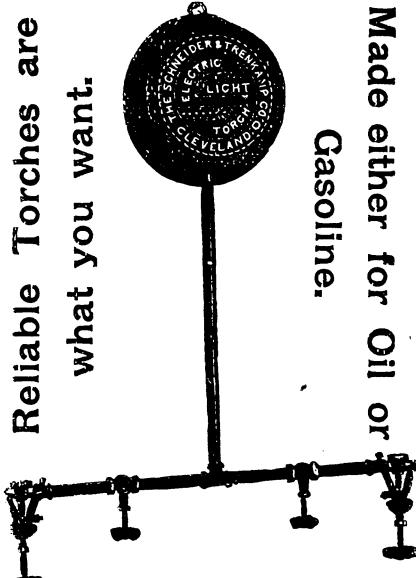
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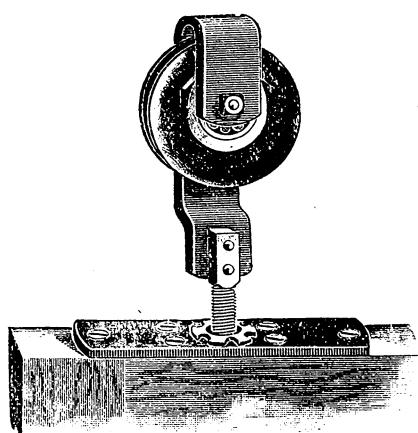


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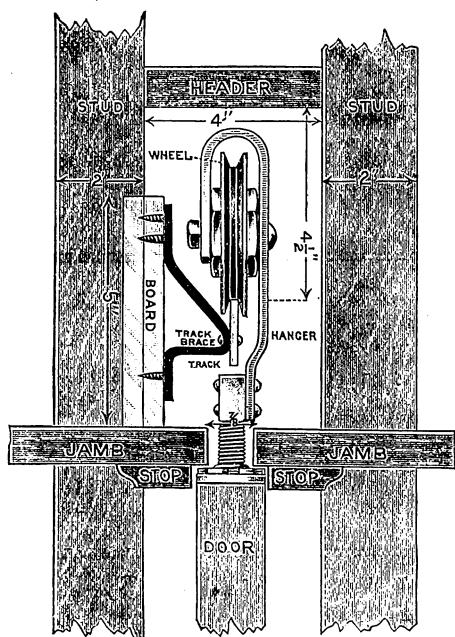
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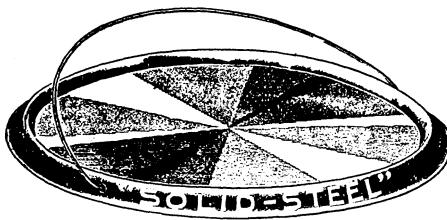
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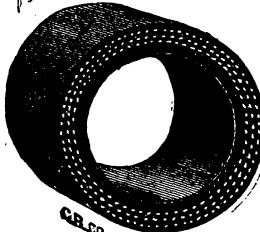
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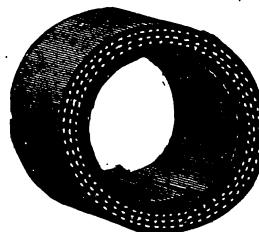
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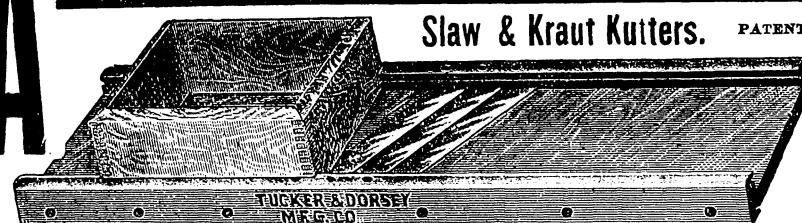
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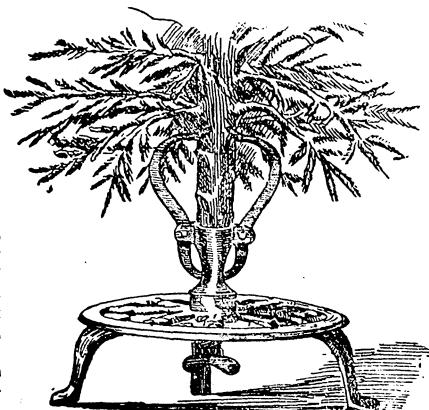
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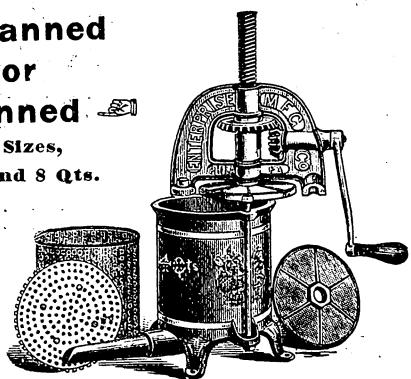
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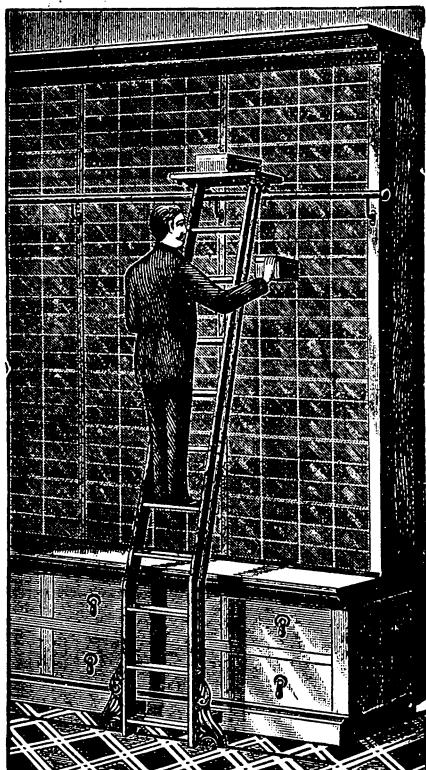
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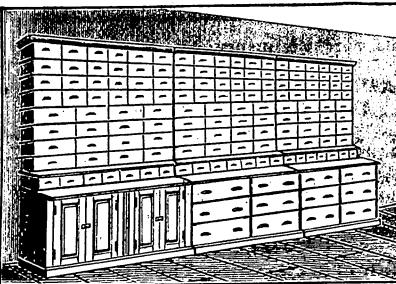
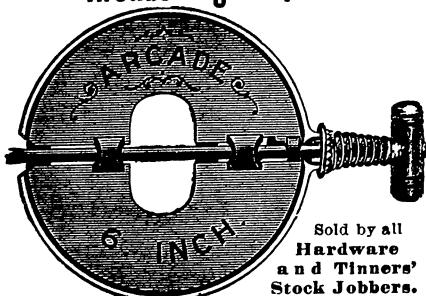
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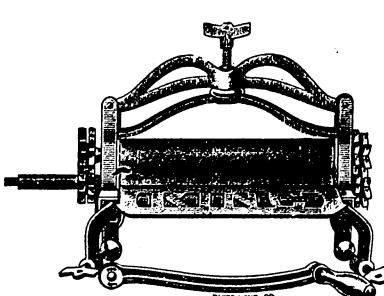
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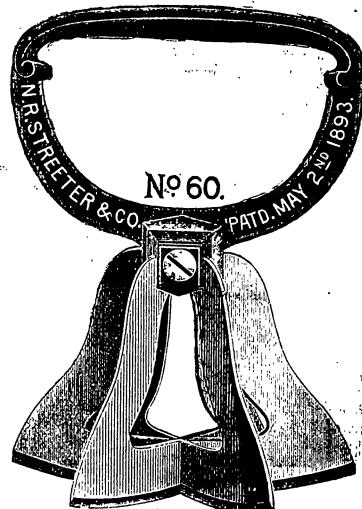
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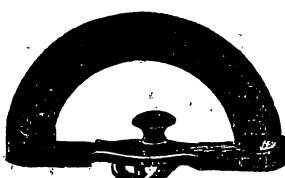
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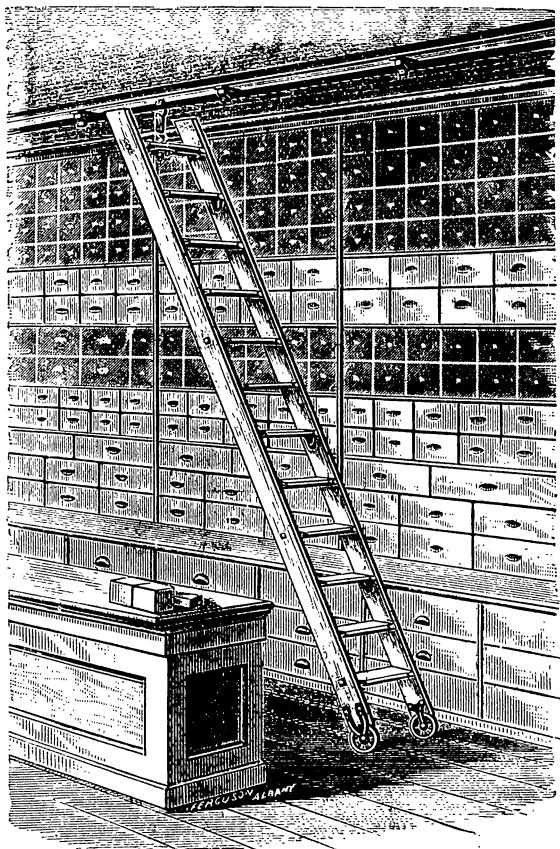
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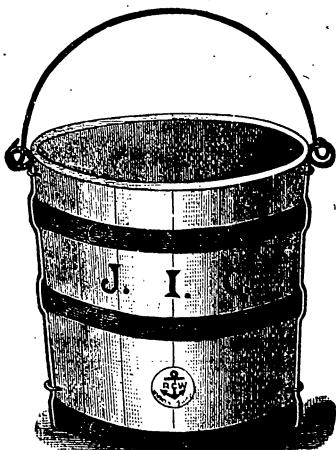
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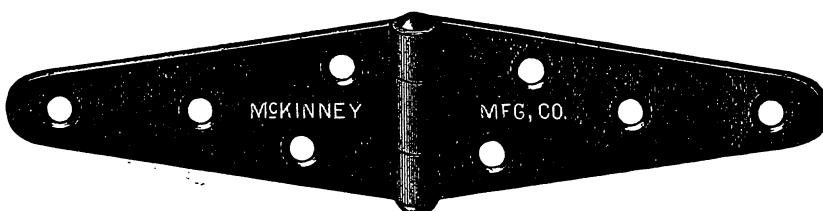
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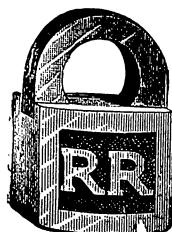
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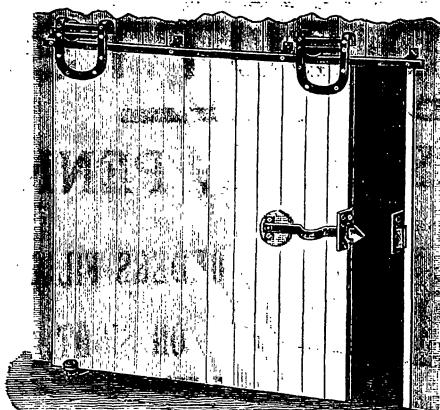
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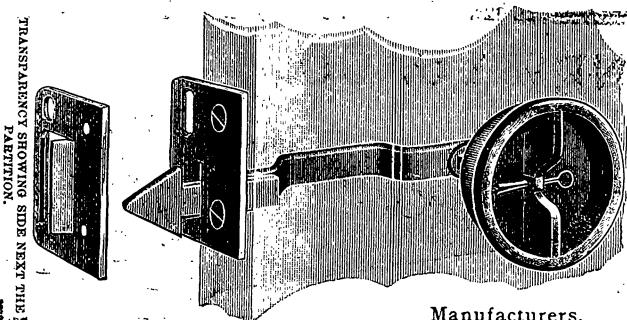
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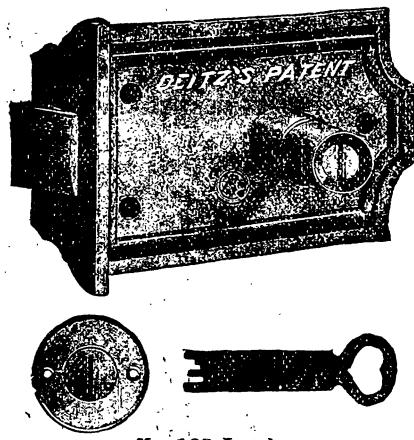
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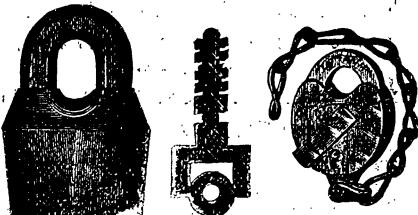
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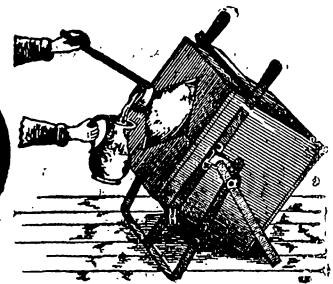
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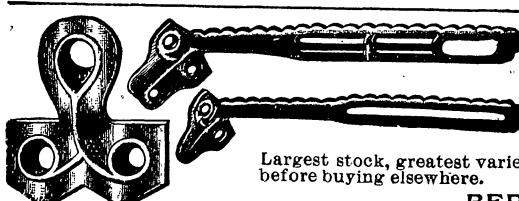
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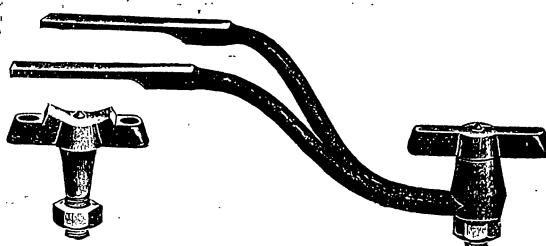
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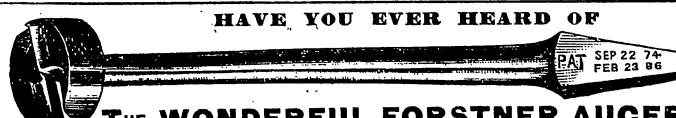
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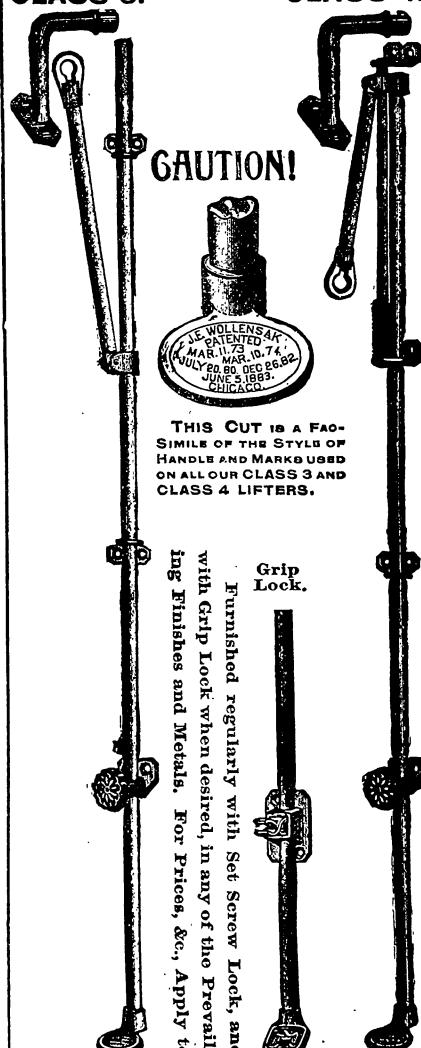
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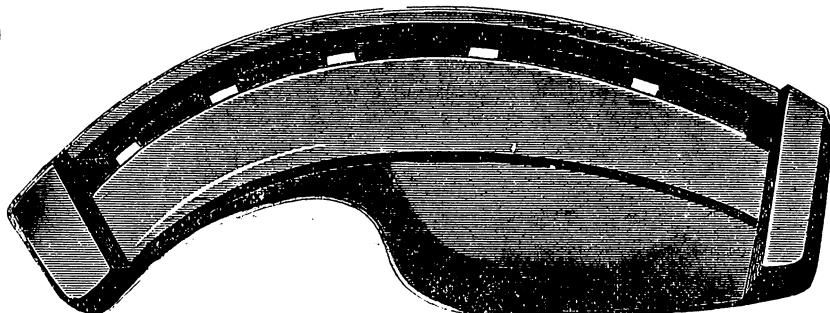
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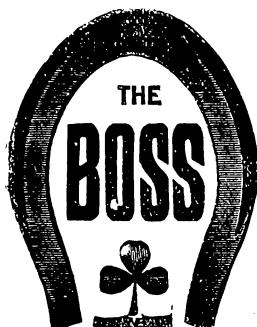
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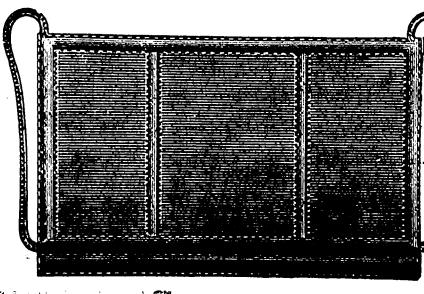
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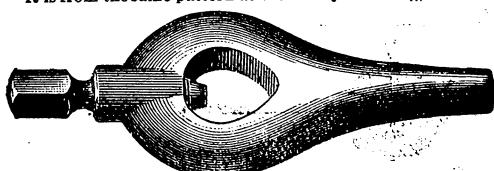
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5	1 1/2	80	15	4 1/2	2 75
6	1 3/4	95	16	5	3 25
7	1 1/2	95	17	5 1/2	4 00
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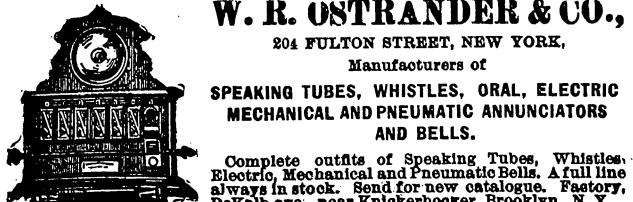


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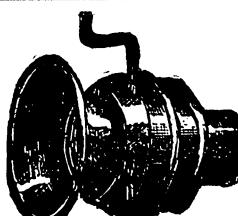
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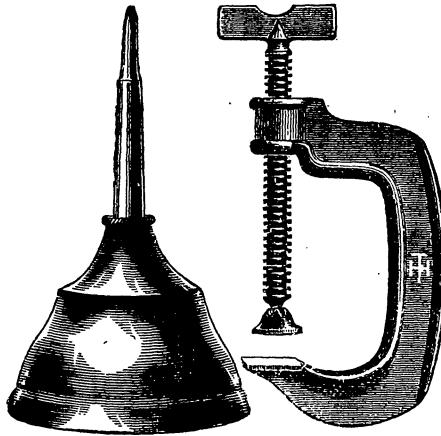
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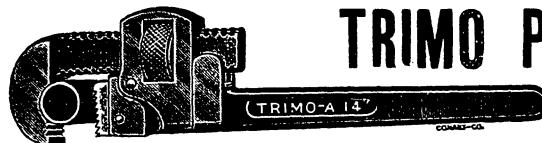


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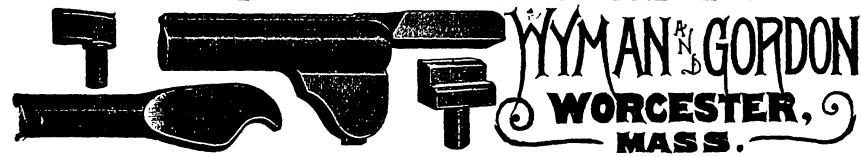
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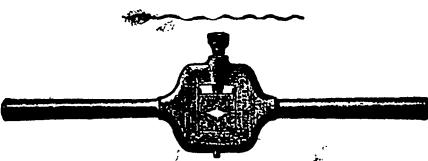
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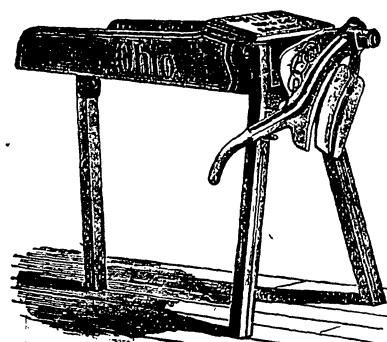
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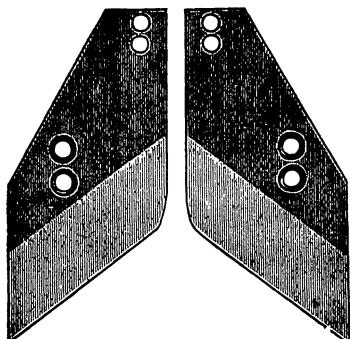
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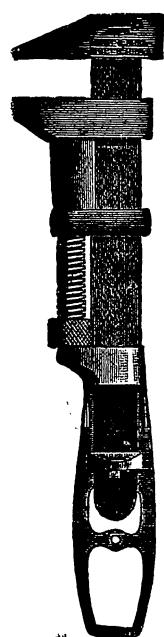
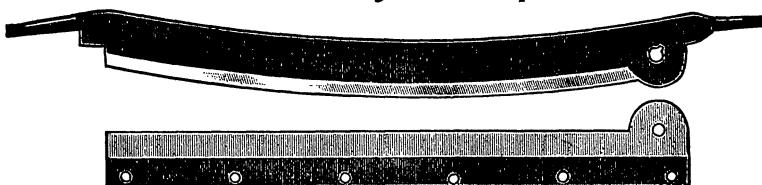


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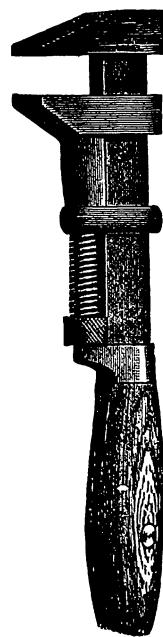
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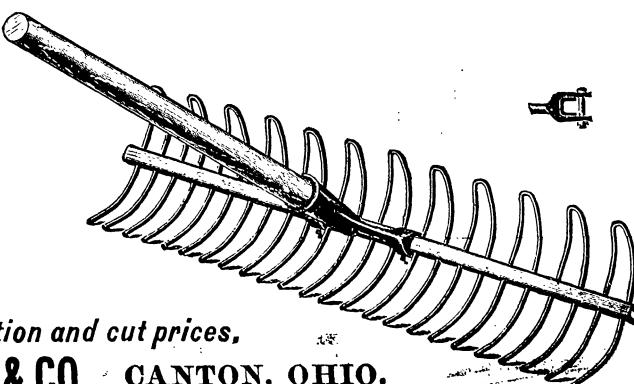
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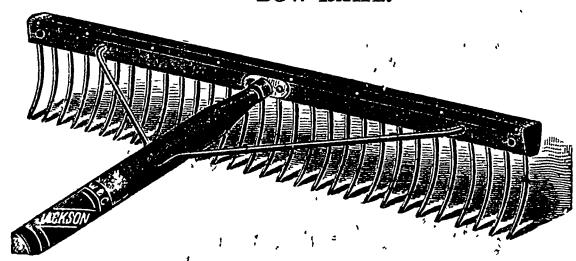
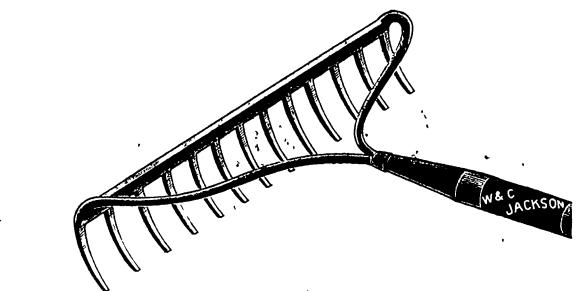
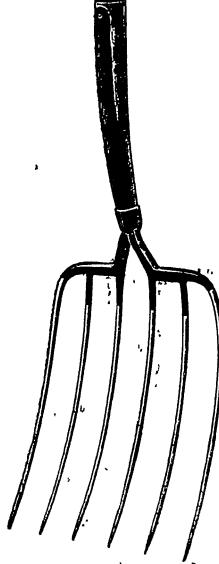
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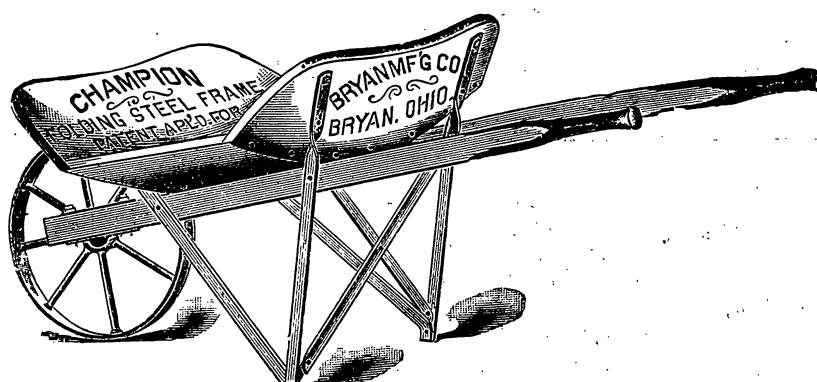
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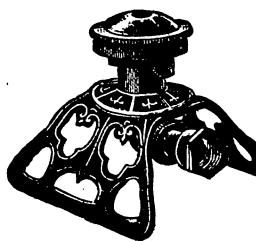
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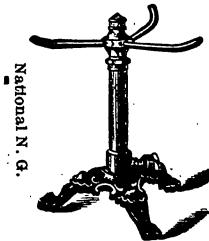
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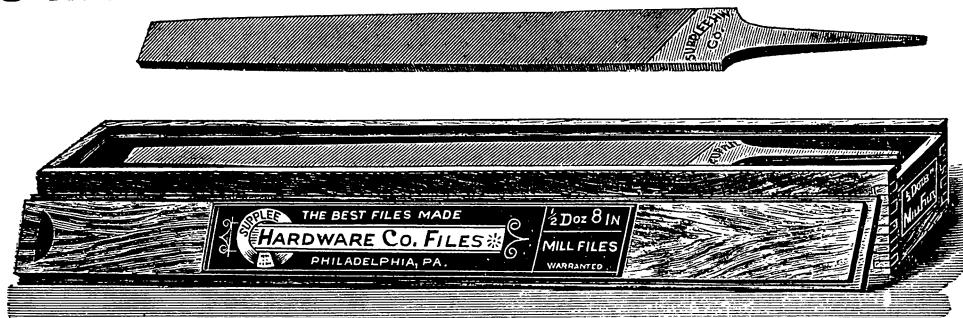
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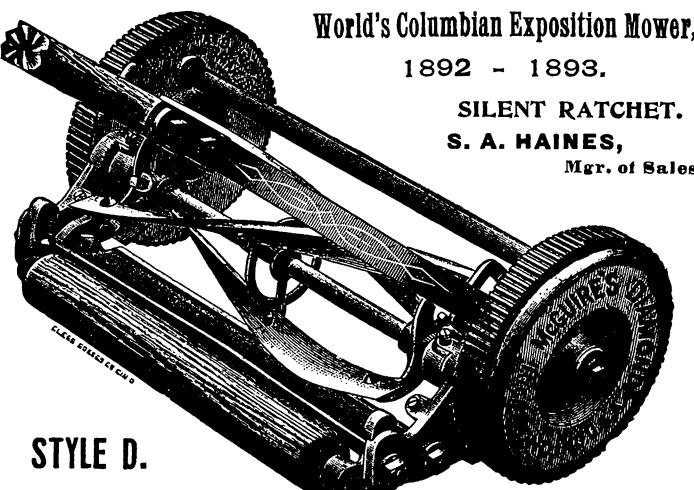
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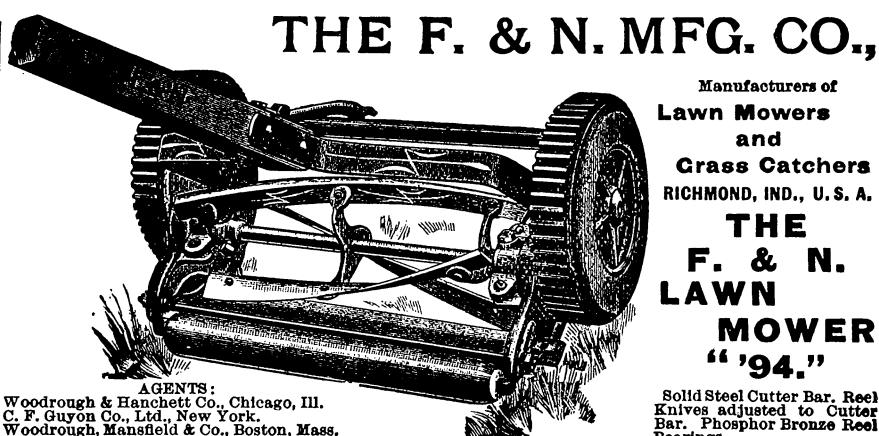
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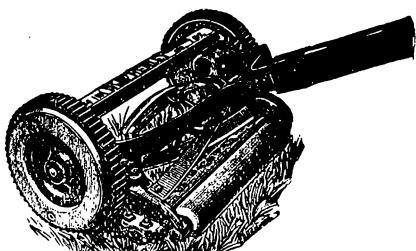
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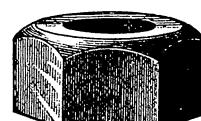
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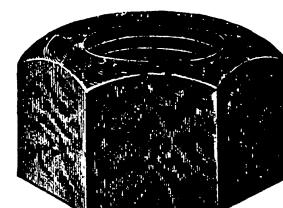


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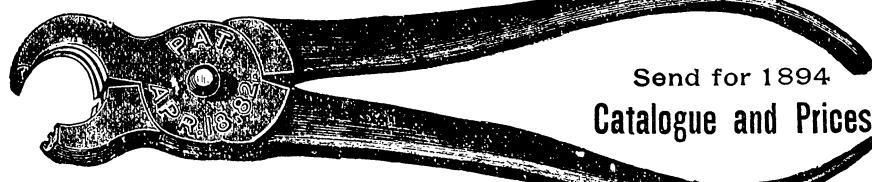
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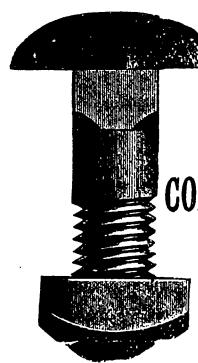
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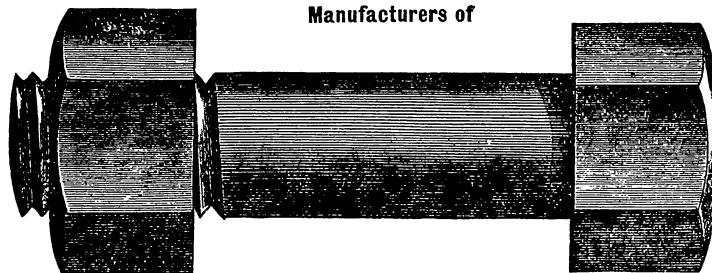
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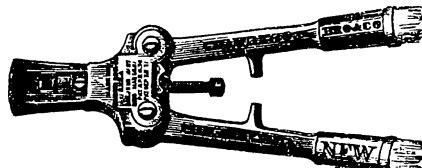
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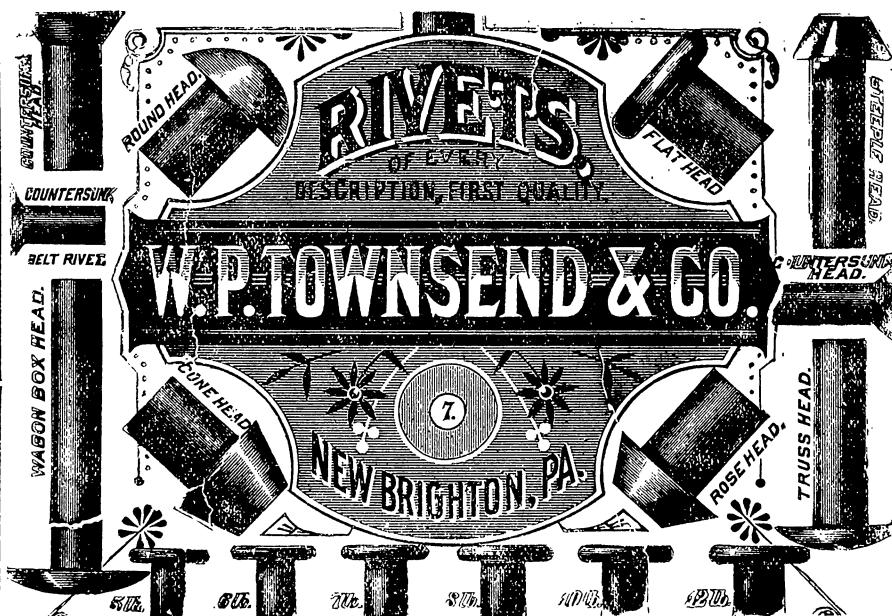


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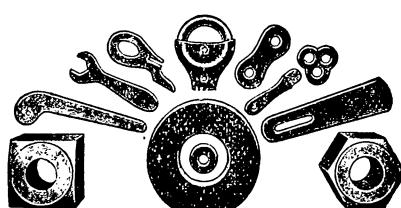
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Ludlow-Saylor Wre Co., St. Louis, Mo.

Washburn & Moen Mfg. Co., Worcester,

**Bar Iron, Manufacturers of.**

Alma-Standard Iron & Steel Co., Bridgeport, Ohio.

Allentown Rolling Mill, Allentown, Pa.

Burden Iron Co., Troy, N. Y.

Crescent Horse Shoe & Iron Co., Max Meadows, Va.

Motor Iron & Steel Co., Danville, Pa.

Mahoning Valley Iron Co., Youngstown, Ohio.

Sternbergh, J. H. & Son, Reading, Pa.

**Barrel Openers.**

Am. Specialty Co., Hartford, Conn.

**Bellows, Manufacturers of.**

Scott, Geo. M., Chicago, Ill.

**Bells.**

Bevin Bros. Mfg. Co., East Hampton.

**Belt Dressing.**

Jos. Dixon Crucible Co., Jersey City, N. J.

**Belt Fasteners.**

Bristol Co., Waterbury, Conn.

Claffen Mfg. Co., Cleveland, Ohio.

Sawyer Hdw. & Supply Co., Pawtucket, R. I.

Talcott, W. O., Providence, R. I.

**Beltting, Makers of.**

Alexander Bros., 412 N. 3d, Phila.

Jeffrey Mfg. Co., Columbus, O.

Link-Belt Engineering Co., Phila., Pa.

Main Belting Co., Philadelphia, Pa.

N. Y. Belting & Packing Co., Ltd., N. Y.

Roberts Mfg. Co., Pittsburgh, Pa.

Shultz Belting Co., St. Louis, Mo.

**Bicycles.**

Crawford Mfg. Co., Hagerstown, Md.

Eagle Bicycle Mfg. Co., Torrington, Ct.

Grand Rapids Cycle Co., Grand Rapids, Mich.

Leaven Cycle Co., Hartford, Conn.

Lovell, Jno. P. Arms Co., Boston, Mass.

Pope Mfg. Co., Boston, Mass.

**Bicycle Spokes.**

Excelsior Needle Co., Torrington, Ct.

**Bicycle Sundries.**

Bevin Bros. Mfg. Co., E. Hampton, Mass.

**Bit Braces.**

Amidon Tool Corp., Buffalo, N. Y.

**Blocks, Tackle, Makers of.**

Cleveland Block Co., Cleveland, O.

Fulton Iron & Engine Works, Detroit, Mich.

**Blowers.**

Buffalo Forge Co., Buffalo, N. Y.

Champion Blower & Forge Co., Lancaster, Pa.

Surtevant, B. F. & Co., Boston, Mass.

**Boats, Sporting.**

American Rubber Boat Co., N. Y.

**Boiler Plates.**

Carbon Steel Co., Pittsburgh, Pa.

McEvily, Wm. & Sons, Reading, Pa.

Lukens Iron & Steel Co., Coatesville, Pa.

Pottstown Iron Co., Pottstown, Pa.

**Boilers, Copper.**

Randolph & Clowes, Waterbury, Conn.

**Boilers, Steam.**

Breck & Wilcox Co., 30 Cortlandt.

Harrison Safety Boiler Wks., Phila., Pa.

Pollcock, W. B. & Co., Youngstown, O.

Porter, H. K., Boston, Mass.

Southwick Fdy. & Mch. Co., Phila., Pa.

Sterling Co., Chicago, Ill.

Wetherill, Robt. & Co., Chester, Pa.

**Bolt Cutters.**

Chambers Bros. Co., Philadelphia.

Howard Iron Works, Buffalo, N. Y.

Wells Bros. & Co., Greenfield, Mass.

**Books.**

Republic Press, 14 Lafayette Place, N. Y.

Williams, David, 96-102 Reade, N. Y.

**Boring Machines.**

Buckeye Mfg. Co., Union City, Ind.

**Box Banders.**

Goodell, J. W., Burlington, Vt.

**Boxes, Hdw. Shelf, &c.**

Green, A. H., 22 Park Place, N. Y.

Jones, Jesse & Co., Philadelphia, Pa.

**Brass, Manufacturers of.**

Ansonia Brass & Copper Co., N. Y.

Davol, John & Sons, 100 John, N. Y.

Plume & Atwood Mfg. Co., N. Y.

Randolph & Clowes, Waterbury, Conn.

Rome Brass & Copper Co., Rome, N. Y.

Scovill Mfg. Co., Waterbury, Conn.

Waterbury Brass Co., 296 B'way, N. Y.

**Brass Butt Hinges.**

Tiebout, W. & J., 16 & 18 Chambers.

**Brass Founders.**

Cram, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

Eynons-Evans Mfg. Co., Philadelphia, Pa.

Fraim, E. T., Lancaster, Pa.

Haight & Clark, Albany, N. Y.

Keys, W. W. & R. M. Co., Bridgeport, Conn.

North Bros. Mfg. Co., Phila., Pa.

Reeves, Paul S., Philadelphia.

**Brass Goods.**

Brass Goods Mfg. Co., 88 Chambers.

**Bread and Cake Knives.**

Clauss Shear Co., Fremont, O.

**Bridge Builders.**

Berlin Iron Bridge Co., East Berlin, Ct.

**Bronze (Tobin).**

Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.

Bridgert Deoxidized Bronze & Metal Co., Bridgeport, Conn.

**Brooms and Brushes.**

Rice Mfg. Co., New Durham, N. H.

**Builders' Hardware.**

Dett, A. E., 97 Chambers St., N. Y.

Reading Hdw. Co., Reading, Pa.

South, W. A. Co., Salem, Mass.

Yale & Towne Mfg. Co., Stamford, Ct.

**Burr Wheels.**

Torrance Iron Co., Troy, N. Y.

**Butchers' Steels.**

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

**Butcher and Shoe Knives, Manufacturers of.**

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Goodell Co., Antrim, N. H.

Wilson, John, Sheffield, England.

**Butts and Hinges.**

McKinney Mfg. Co., Allegheny, Pa.

Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.

Tiebout, W. & J., 16 Chambers, N. Y.

Wrightsville Hdw. Co., Wrightsville, Pa.

**Cabinet Benches.**

Grand Rapids Hand Screw Co., Grand Rapids, Mich.

**Calipers and Dividers.**

J. Stevens Arms and Tool Co., Chicopee Falls, Mass.

Starrett, L. S., Athol, Mass.

**Car Axles.**

Roberts, A. P. & Co., Phila.

**Carboy Stands.**

Wolf, W. & L., Philadelphia, Pa.

**Carriage Hardware, Makers of.**

Clapp, E. D. Mfg. Co., Auburn, N. Y.

Coverly's Saddlery Works, Farmer, N. Y.

Eccles, Richard, Auburn, N. Y.

McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.

Buffalo, N. Y.

Scranton Forging Co., Scranton, Pa.

Smith, H. D. & Co., Plantsville, Conn.

Wilcox & Howe, Birmingham, Conn.

Wilcox, H. & Co., New Haven, Conn.

Wilcox & Howe, Phila., Pa.

Wilcox & Howe, Scranton, Pa.

Wilcox & Howe, Troy, N. Y.

Wilcox & Howe, Utica, N. Y.

Wilcox & Howe, W. H. & Co., Utica, N. Y.

Wilcox & Howe, W. H. & Co., Utica, N. Y.

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Wilcox & Howe, W. H. & Co., Utica, N. Y.

Wilcox & Howe, W. H. & Co., Utica, N. Y.

**Egg Beaters.**  
North Bros. Mfg. Co., Philadelphia, Pa.

**Electric Bells and Supplies.**  
Ostrander, W. R. & Co., 204 Fulton St., New York.  
Wollensak, J. F., Chicago, Ill.

**Electric Lights.**  
Electric Construction & Supply Co., 18 Cortlandt St., N. Y.

**Elevator Buckets.**  
Clark, W. J. & Co., Salem, O.

**Elevators, Makers of.**  
Link-Belt Engineering Co., Phila., Pa.  
Morse, Williams & Co., Phila., Pa.  
Penns. Elevator Engineering Co., Phila., Pa.

**Emery and Emery Wheels.**  
Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
N. Y. Belting & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Sterling Emery Wheel Co., 174 Fulton St., N. Y.  
Tanite Co., Stroudsburg, Pa.

**Emery Wheel Dressers.**  
Bay State Stamping Co., Worcester, Mass.

**Engines and Contractors.**  
Aikens, Henry, Pittsburgh, Pa.  
Herrick, J. A., 284 Park St., N. Y.  
Kennedy, Julian, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
Lean, D. R. Co., Pittsburgh, Pa.  
McClure, Amsler & Co., Pittsburgh, Pa.  
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.

**Engines, Gas and Gasoline.**  
Buckeye Mfg. Co., Union City, Ind.  
Otto Gas Engine Works, Phila., Pa.  
Springfield Gas Engine Co., Springfield, Ohio.

**Engines, Steam, Makers of.**  
Allis, E. P. Co., Milwaukee, Wis.  
Besse Foundry & Machine Works, Ft. Wayne, Ind.  
Harris, Wm. A., Steam Engine Co., Providence, R. I.  
Norwalk Iron Works Co., So. Norwalk, Conn.  
Phila. Engineering Works, Phila., Pa.  
Southwick Foundry & Machine Co., Phila., Pa.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Westwick, Jno. & Son, Galena, Ill.  
Wetherill, Robt. & Co., Chester, Pa.

**Exercise.**  
Independent Electric Co., Chicago, Ill.

**Expansion Bolts.**  
Boone, W. C. Mfg. Co., Boonton, N. J.  
Church, Isaac, Toledo, O.  
Steward & Romaine Mfg. Co., Phila., Pa.

**Exporters.**  
Flint & Co., 68 Broad St., N. Y.

**Faucets, Self-Measuring.**  
Lane Bros., Poughkeepsie, N. Y.

**Faucets, Wooden, Makers of.**  
John Sommer's Son, Newark, N. J.

**Feed-Water Heaters and Purifiers.**  
Davis, I. B. & Son, Hartford, Conn.  
Harrison Safety Boiler Works, Phila., Pa.  
National Pipe Bending Co., New Haven, Conn.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coll Pipe Co., Elmwood, Conn.

**Fence Ratchets.**  
Wire Fence Supply Co., Indianapolis, Ind.

**Fencing, Iron and Wire.**  
Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Chess Bros., Pittsburgh, Pa.  
Clinton Wire Cloth Co., Clinton, Mass.  
Gilbert & Bennett Mfg. Co., 42 Cliff St.  
Kilmer Mfg. Co., Newburgh, N. Y.  
The Van Dorn Iron Works Co., Cleveland, O.

**Files, Importers of.**  
Moss, F. W., 80 John St., N. Y.

**Files and Rasps, Manufacturers of.**  
Arcade File Works, Anderson, Ind.  
Banker & White, Troy, N. Y.  
Barnett, G. & H., 41 & 43 Richmond, Phila.  
McCaffrey File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.  
Supplee Hardware Co., Phila., Pa.

**Fire Brick, Makers of.**  
Borgne, Cyrus, Philadelphia, Pa.  
Gardner, Jas. & Son, Cincinnati, Md.  
Kretschmer, B. & Sons, foot E. Houston St., N. Y.  
Maurel, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Valentine, M. D. & Bro. Co., Woodbridge.

**Fire Doors.**  
Berlin Iron Bridge Co., E. Berlin, Conn.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.

**Fishing Tackle.**  
Dame, Stoddard & Kendall, Boston, Mass.

**Flint and Emery Paper.**  
Baeder, Adamson & Co., Phila., Pa.

**Fodder Cutters.**  
Silver Mfg. Co., Salem, O.

**Forges, Portable, &c.**  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Foos Mfg. Co., Springfield, Ohio.  
Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Steel-Cambria Iron Co., Johnstown, Pa.  
Frankford Steel Co., Phila., Pa.  
Scranton Forging Co., Scranton, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.

**Forks, Hay and Manure.**  
Iowa Farming Tool Co., Ft. Madison, Iowa.  
Withington & Cooley Mfg. Co., Jackson, Mich.

**Foundry Facings.**  
Dixon, Jos., Crucible Co., Jersey City, N. J.  
S. Obermayer Co., Cincinnati, O.  
Smith's Pattern Works, Akron, Ohio.

**Foundry Riddles.**  
Estey, W. S., 65 Fulton, N. Y.

**Foundry Supplies.**  
S. Obermayer Co., Cincinnati, O.  
Rice Mfg. Co., New Durham, N. H.  
Smith, J. D., Fdy. Supply Co., Cinn., O.

**Friction Clutches.**  
Brown, A. & F., 17 Dey St., N. Y.  
Keystone Clutch & Mch. Wks., Phila., Pa.  
Moore & White Co., Philadelphia, Pa.

**Furnaces, Foundry.**  
Byrnes & Co., Detroit, Mich.

**Galvanized Material.**  
Jersey City Galvanizing Co., 112 John St., N. Y.

**Galvanizing and Tinning.**  
Wilcox, Crittenden & Co., Middletown, Conn.

**Gas Producers.**  
Wood, R. D. & Co., Philadelphia, Pa.

**Gas Stoves.**  
Bogliano Mfg. Co., Baltimore, Md.

**Gas & Steam Fitters' Supplies.**  
Leavitt Mch. Co., Orange, Mass.  
Pancost, Henry B. & Co., Phila., Pa.

**Gate Hinges.**  
Wrightsville Hdw. Co., Wrightsville, Pa.

**Gear Cutters.**  
D. E. Whitton Mach. Co., New London, Conn.

**Gears.**  
Boston Gear Works, Boston, Mass.  
Lincoln Iron Works, Rutland, Vt.  
Poole, Robt. & Son Co., Baltimore, Md.  
U. S. Projectile Co., Brooklyn, N. Y.

**Glass Boards.**  
Canton Saw Co., Canton, O.  
Lutkin Rule Co., Saginaw, Mich.

**Glass Cutters.**  
Monce, S. G., Bristol, Conn.

**Glaziers' Points.**  
Shelton Co., Birmingham, Conn.

**Glue.**  
Baeder, Adamson & Co., Phila., Pa.  
Dodd, A. W. & Co., Gloucester, Mass.  
Russia Cement Co., Gloucester, Mass.

**Grate Guards.**  
Dow Wire Works Co., Louisville, Ky.

**Grinding Mills.**  
Foos Mfg. Co., Springfield, O.

**Grinding and Polishing Machines.**  
Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
Norton Emery Wheel Co., Worcester, Mass.

**Grindstone Dressing Machinery.**  
Blake & Johnson, Waterbury, Conn.

**Grindstones.**  
Cleveland Stove Co., Cleveland, O.

**Gun Implements.**  
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

**Gunpowder, Makers of.**  
Lafin & Rand Powder Co., 29 Murray St., N. Y.

**Gymnasium Supplies.**  
Independent Electric Co., Chicago, Ill.

**Handles.**  
Cleveland Wood Turning Co., Cleveland, O.

**Hangers, Door.**  
Chicago Spring Butt Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Graham, John H. & Co., 113 Chambers Street, N. Y.  
Lane Bros., Poughkeepsie, N. Y.

**Hardware Comm'n Merchants.**  
Graham, John H. & Co., 111 Chambers St., New York.  
Jacobus, W. H., 90 Chambers, N. Y.

**Hardware Drawers.**  
Wernicke Co., Minneapolis, Minn.

**Hardware Jobbers.**  
White, Van Glahn & Co., 15-17 Chat ham Square, N. Y.

**Hardware Manufacturers.**  
Allentown Hardware Works, Allentown, Pa.  
Miller Falls Co., 93 Read St., N. Y.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Streeter, N. R. & Co., Groton, N. Y.  
Supplee Hdw. Co., Phila., Pa.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Hardware Mfrs. Agents.**  
Bingham, W. Co., Cleveland, O.  
Clarke, Thomas, St. John, N. B.  
Graham, John H. & Co., 113 Chambers Street, N. Y.  
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

**Hardware Specialties.**  
Acme Shear Co., Bridgeport, Conn.  
Berger Bros., Philadelphia, Pa.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Johnson, S. C., Racine, Wis.  
North Bros. Mfg. Co., Philadelphia, Pa.  
Scranton & Co., New Haven, Conn.  
Union Lock & Hdw. Co., Lancaster, Pa.  
Wilson, J. Fred., Worcester, Mass.  
Wrightsville Hdw. Co., Wrightsville, Pa.

**Harness Snaps.**  
Covert Mfg. Co., West Troy, N. Y.  
Cover's Saddlery Wks., Farmer, N. Y.  
Fitch, W. & E. T., New Haven, Conn.

**Hay Tools.**  
Myers, F. E. & Bro., Ashland, O.

**Hoes.**  
Iowa Farming Tool Co., Ft. Madison, Iowa.  
Withington & Cooley Mfg. Co., Jackson, Mich.

**Horseshoe Rings and Ringers.**  
Oakes & Irwin, Decatur, Ill.

**Hoisting Machines.**  
Box, Alfred & Co., 314 Green, Phila., Pa.  
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.  
Byers, Jno. F. Mch. Co., Ravenna, O.  
Fulton Iron & Engine Wks., Detroit, Mich.  
Harrington, E., Son & Co., Phila., Pa.  
Lidgerwood Mfg. Co., 96 Liberty, N.Y.  
Lincoln Iron Works, Rutland, Vt.  
McCoy, Jos. F. & Co., 26 Warren St.  
Maris & Beekley, Philadelphia.  
Moore Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila., Pa.  
Sellers, Wm. & Co., Phila., and N. Y.  
Speidel, J. G., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.

**Hollow Ware.**  
Avery Stamping Co., Cleveland, O.  
Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
Stuart & Peterson Co., Phila., Pa.

**Horse Clippers.**  
Gillette Clipping Machine Co., 201 E. 23d st., N. Y.

**Horse Nails, Makers of.**  
Capewell Horse Nail Co., Hartford, Conn.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston, Mass.

**Horse and Mule Shoes, Makers of.**  
Byrdon Horse Shoe Co., Catasauqua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Leonard, J., 446 West St., N. Y.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.

**Hose.**  
Cleveland Rubber Works, Cleveland, O.  
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

**Hydrants, &c.**  
McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Forging.**  
U. S. Projectile Co., Brooklyn, N. Y.

**Hydraulic Jacks.**  
Dudgeon, Richard, 24 Columbia, N. Y.  
McCoy, Jos. F. Co., 26 Warren St., N. Y.

**Hydraulic Machinery.**  
Wood, Wm. H., & edia, Pa.

**Ice Cream Freezers.**  
White Mountain Freezer Co., Nashua, N. H.

**Injectors.**  
Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York.

**Insurance, Boiler.**  
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.**  
Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.

**Iron Commission Brokers.**  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila., Pa.  
Etting, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lee, J. Tatnall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. & Co., Phila., Pa.

**Iron Ore.**  
Samuel, Frank, Philadelphia, Pa.

**Iron, Merchants.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cox, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila., Pa.  
Cullifffe, R. M., Phila., Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolis, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 577 to 683 Greenwich St., N. Y.

**Pierson & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., 66 B'way, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.**

**Iron, Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston.  
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet, Manufacturers of.**  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
DeWees Wood Co., Lim., McKeesport, Pa.

**Ironwork, Ornamental.**  
Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
The Van Dorn Iron Works Co., Cleveland, O.

**Japanning.**  
Smith, Theo. V., 54 John St., N. Y.

**Keys.**  
Wollensak, J. F., Chicago, Ill.

**Ladies.**  
Whiting Fdy. Equipment Co., Chicago, Ill.

**Lanterns.**  
Buhi Stamping Co., Detroit, Mich.  
Steam Gauge & Lantern Co., Syracuse, N. Y.

**Lasts.**  
Kupferle, Jno. C., St. Louis, Mo.

**Lathes.**  
Beaman & Smith, Providence, R. I.  
Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H. Jr., & Co., Philadelphia, Pa.  
New Haven Mfg. Co., New Haven, Conn.  
Sebastian Lathe Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Lathing, Expanded Metal.**  
Chess Bros., Pittsburgh, Pa.

**Lathing, Wire.**  
Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Lawn Mowers.**  
Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.  
Coldwell Lawn Mower Co., Newburg, N. Y.  
Dille & McGuire Mfg. Co., Richmond, Ind.  
F. & N. Mfg. Co., Richmond, Ind.  
Henley, M. C., Richmond, Ind.

**Lawn Rakes.**  
Gibbs Mfg. Co., Canton, Ohio.  
Kohler, F. E. & Co., Canton, O.

**Lawn Sprinklers.**  
Blair Mfg. Co., Springfield, Mass.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
McGowan, John H. Co., Cincinnati, O.

**Letters and Figures, Metallic.**  
White, A. A. & Co., Providence, R. I.

**Letters, Paper.**  
Tablet & Ticket Co., Chicago, Ill.

**Levels.**  
Richardson, C. F. & Son, Athol, Mass.

**Locks and Knobs, Manufacturers of.**  
Deitz, A. E., 97 Chambers, N. Y.  
Reading Hdw. Co., Reading, Pa.  
Smith & Egge Mfg. Co., Bridgeport, Conn.  
Warner Lock Co., Chicago, Ill.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Lubricants.**  
Dixon, Jos., Crucible Co., Jersey City N. J.

**Machinery.**  
Am. Tool Works, Cleveland, Ohio.  
Ayer, H. C. & Gleason Co., Phila., Pa.  
Barnes, W. F. & John, Rockford, Ill.  
Beaman & Smith, Providence, R. I.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 46 Dey, N. Y.  
Birkland & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Briggs, Marvin, 12 Broadway, N. Y.  
Bullard Mch. Tool Co., Bridgeport, Conn.  
Carlins Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., 47, 74 Cortlandt, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Laight & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila., Pa.  
Hartford Machine Screw Co., Hartford, Conn.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Johnson, Israel H. Jr., & Co., Phila., Pa.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinists' Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Ct.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 188 Liberty St., N. Y.  
Pittsburgh Mch. Co., Pittsburgh, Pa.

**Place, Geo.**, 145 Broadway, N. Y.  
**Pond**, L. W. Mch., Co., Worcester, Mass.  
**Poole**, Robt. & Son Co., Baltimore, Md.  
**Powell Planer Co.**, Worcester, Mass.  
**Prentiss Tool & Supply Co.**, N. Y.  
**Scranton Supply & Mchry. Co.**, Scranton, Pa.  
**Sellers, Wm. & Co.**, Phila.  
**Seyfert's Sons**, L. F., Philadelphia, Pa.  
**Sigourney Tool Co.**, Hartford, Conn.  
**Steptos, J. & Co.**, Cincinnati, O.  
**Stow Flexible Shaft Co.**, Ltd., Phila.  
**Toomey, Frank**, Philadelphia, Pa.  
**Walker Mch. Co.**, Cleveland, O.  
**Wetherill, Robert & Co.**, Chester, Pa.  
**Wilson, W. A.**, Rochester, N. Y.

**Machinery for Hardware Manufacturers.**  
 Adt. Jno. & Son, New Haven, Conn.

**Machine Knives.**  
 Loring, Coes & Co., Worcester, Mass.  
 Loyd, John, 558-562 Water St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.

**Machine Screws.**  
 American Iron & Bolt Co., Cincinnati, Ohio.  
 Rubbell, Harvey, Bridgeport, Ct.  
 Rhode Island Tool Co., Providence, R. I.

**Machine Tools.—See Machinery.**

**Machine Work.**  
 Papping, J., 58th St. & 11th Ave., N. Y.

**Measuring Tapes.**  
 Lufkin Rule Co., Saginaw, Mich.

**Meat Choppers.**  
 Enterprise Mfg. Co., Philadelphia, Pa.

**Meat Cutters.**  
 North Bros. Mfg. Co., Philadelphia, Pa.

**Mechanical Instruction.**  
 Correspondence School of Mechanics, Scranton, Pa.

**Metals.**  
 Fearing, Wm. S., 100 Chambers, N. Y.  
 Hendricks Bros., 49 Cliff, N. Y.

**Metal Brokers.**  
 American Metal Co., N. Y.

**Metal Saws.**  
 Q. & C. Co., Chicago, Ill.

**Metallurgists.**  
 Britton, J. Blodgett, Phila., Pa.

**Mincing Knives.**  
 Palmer Hdw. Mfg. Co., Troy, N. Y.  
 Streeter, N. R. & Co., Groton, N. Y.

**Mine Lamps.**  
 Darby, Edw. & Sons, Phila., Pa.  
 Leonard, E. E., Scranton, Pa.

**Mining Screens.**  
 Harrington & King Perforating Co., Chicago, Ill.

**Howard & Morse**, 45 Fulton, N. Y.

**Mining Machinery.**  
 Allis, E. P. Co., Milwaukee, Wis.

**Models, Makers of.**  
 Ideal Machine Works, Hartford, Conn.

**Molding Sand.**  
 Obermayer, S. Co., Cincinnati, O.

**Motors, Water and Electric.**  
 Bolgiano Mfg. Co., Baltimore, Md.  
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.

**Dallett, Thomas H. & Co.**, Phila., Pa.

**Nail Machinery.**  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nail and Tack Pullers.**  
 Am. Specialty Co., Hartford, Conn.  
 Scranton & Co., New Haven, Conn.

**Nails (Cut) and Spikes.**  
 Borden & Lovell, 70 West, N. Y.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.  
 Valley Steel Co., St. Louis, Mo.

**Nickel Plated Supplies.**  
 Eddy Electric Mfg. Co., Windsor, Conn.

**Norway Shapes, Rollers of.**  
 Rowland, William & Harvey, Frankford, Philadelphia.

**Novelty Manufacturers.**  
 Ideal Machine Works, Hartford, Conn.

**Nut Machines.**  
 Dunham Nut Co., Unionville, Ct.

**Nuts, Bolts, &c., Makers of.**  
 American Bolt Co., Lowell, Mass.  
 American Iron & Bolt Co., Cincinnati, Ohio.

**American Screw Co.**, Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.  
 Port Chester Bolt & Nut Co., Port Chester, N. Y.  
 Rhode Island Tool Co., Providence, R. I.  
 Russell, Burdsall & Ward, Port Chester, N. Y.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred., Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.

**Oilers.**  
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Oil Heaters.**  
 Parker, Chas. Co., Meriden, Conn.

**Oilless Anti-Friction Metals.**  
 North American Metalline Co., Long Island City, N. Y.

**Oil Stones.**  
 Pike Mfg. Co., Pike Station, N. H.

**Ores.**  
 Wister, Francis, Philadelphia, Pa.

**OX Shoes.**  
 Scranton Forging Co., Scranton, Pa.

**Packing.**  
 Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.

**Padlocks.**  
 Ames Sword Co., Chicopee, Mass.  
 Franklin, E. T., Lancaster, Pa.  
 Union Lock & Bow Co., Lancaster, Pa.  
 Wolf, W. & L., Phila., Pa.

**Pails.**  
 Richmond Cedar Wks., Richmond, Va.

**Paint.**  
 Garry Iron & Steel Roofing Co., Cleveland, O.

**Paint Burners.**  
 Dangler Stove & Mfg. Co., Cleveland, Ohio.

**Paint Cans.**  
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Pants Stretcher.**  
 Covert Mfg. Co., West Troy, N. Y.

**Patent Solicitors.**  
 Butler, C. N., Phila., Pa.  
 Jenner, H. W. T., Washington, D. C.  
 Howson & Howson, Philadelphia and Washington.  
 Stocking, E. B., Washington, D. C.

**Pattern Letters.**  
 Wells, Heber, 157 William St., N. Y.

**Perforated Metal.**  
 Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chicago, Ill.  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

**Phosphor Bronze.**  
 Phosphor Bronze Smelting Co., Limited, Philadelphia.

**Phosphor Tin.**  
 Crescent Phosphorized Metal Co., Philadelphia, Pa.  
 Halk & Naumann, 516 Pearl, N. Y.

**Picks and Mattocks.**  
 Plumb, Fayette R., Philadelphia, Pa.

**Pig Iron.**  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Montour Iron & Steel Co., Danville, Pa.  
 Taylor & Co., 45 Wall, N. Y.  
 Pilling & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.

**Pig Iron Storage.**  
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

**Pile Drivers.**  
 Vulcan Iron Works, Chicago, Ill

**Pipe, Bent.**  
 National Pipe Bending Co., New Haven, Conn.

**Pipe Cutting and Threading Machines.**  
 Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignal & Keele Mfg. Co., St. Louis, Mo.  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 Merrill Mfg. Co., Toledo, O.  
 Pancoast, Henry B. & Co., Phila.  
 Saunderson's Sons, D. Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.

**Pipe Grips.**  
 Prentiss Vise Co., 44 Barclay, N. Y.

**Pipes, Fittings, &c., Makers of.**  
 McNab & Harlin Mfg. Co., N. Y.

**Pipe, Water and Gas, Makers of.**  
 Donaldson Iron Co., Emaus, Pa.  
 Riverside Iron Works, Wheeling, W. Va.  
 Wood, R. D. & Co., Philadelphia, Pa.

**Plane Irons, Manufacturers of.**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.

**Planers.**  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 New Haven Mfg. Co., New Haven, Conn.  
 Pond, L. W. Mch. Co., Worcester, Mass.  
 Powell Planer Co., Worcester, Mass.  
 Wilson, W. A., Worcester, Mass.

**Planes, Manufacturers of.**  
 Stanley Rule & Level Co., N. Y.

**Plated Ware.**  
 Boardman, L. & Son, New Haddam, Ct.  
 Holmes & Edwards Silver Co., Bridgeport, Conn.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.

**Plate, Iron and Steel, Mfrs. of.**  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Youngstown, Ohio.  
 Moorehead-McLean Co., Pittsburgh, Pa.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville, Pa.

**Shiner, Nimick & Co.**, Pittsburgh, Pa.  
 The Mahoning Valley Iron Co., Youngstown, O.  
 Wood, Alan Co., Philadelphia.

**Plating, Nickel, Brass and Silver.**  
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Polishing Machines.**  
 Watson & Stillman, 204 E. 43d, N. Y.

**Post Hole Diggers.**  
 Gibbs Mfg. Co., Canton, Ohio.  
 Kohler, F. E. & Co., Canton, O.

**Poultry Nettings.**  
 Barnum, E. T., Detroit, Mich.  
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
 Wire Cloth Co., Trenton, N. J.  
 "Silver Finish."

**Tyler Wire Works Co.**, W. S., Cleveland, O.  
 Wright & Colton Wire Cloth Co., Worcester, Mass.

**Powder.**  
 Lafin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.

**Power Hammers.**  
 Dienelt & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsburg, Vt.  
 Jenkins & Linglie, Bellefonte, Pa.  
 Miner & Peck Mfg. Co., New Haven Conn.

**Scrapers, Corrugating Co.**, Jersey City, N. J.

**Power Transmitting Machinery.**  
 Dodge Mfg. Co., Mishawaka, Ind.

**Presses, Dies, &c.**  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Mch. Co., Waterbury Ct.

**Presses, Power, Makers of.**  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

**Printing and Embossing.**  
 Griffith, Axtell & Cady Co., Holyoke, Mass.

**Pulleys.**  
 Brown, A. & F., 17 Dey St., N. Y.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Keystone Clutch Mch. Wks., Phila., Pa.  
 Reading Wood Pulley Co., Reading, Pa.

**Pumping Machinery.**  
 Dean Bros., Steam Pump Works, Indianapolis, Ind.  
 Goulds Mfg. Co., Seneca Falls, N. Y.  
 Hooker-Colville Steam Pump Co., St. Louis, Mo.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Works Co., So. Norwalk Conn.  
 Southwark Fdy. & Mch. Co., Phila., Pa.  
 Valley Pump Works, Easthampton, Mass.  
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.

**Pumy Leathers.**  
 Detroit Valve & Washer Co., Detroit, Mich.

**Pumps, Makers of.**  
 Deming Co., Salem, O.  
 Douglas, W. & B., Middletown, Conn.  
 Goulds Mfg. Co., Seneca Falls, N. Y.  
 Myers, F. E. & Bro., Ashland, O.

**Punches.**  
 Richards, I. P., Providence, R. I.

**Punches and Shears, Hand and Power.**  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 43d, N. Y.

**Rails, Old and New.**  
 Perry, W. H. & Co., Providence, R. I.

**Rat and Mouse Traps.**  
 Burditt & Williams, Boston, Mass.  
 Estey, W. S., 65 Fulton, N. Y.  
 Excelsior Cutlery Co., Worcester, Mass.

**Razors, Manufacturers of.**  
 Millbury Razor Co., Millbury, Mass.

**Re-Seating Machines.**  
 Leavitt Mch. Co., Orange, Mass.

**Reducing Valves.**  
 D'Este & Seeley Co., Boston, Mass.

**Reels.**  
 Hendryx, A. B. Co., New Haven, Conn.

**Refrigerator Door Fasteners.**  
 Conroy, P. J. & Co., Philadelphia.

**Refrigerators.**  
 Wisconsin Refrigerator Co., Eau Claire, Wis.

**Rivets.**  
 Blake & Johnson, Waterbury, Conn.  
 Burden Iron Co., Troy, N. Y.  
 Clark & Cowles, Plainville, Conn.  
 Cobb & Drew, Plymouth, Mass.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton, Pa.

**Riveting Machines.**  
 Adt. Jno. & Sons, New Haven, Conn.

**Rolling Mill Machinery.**  
 Birmingham Iron Fdry., Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 East Chicago Fdy. Co., Chicago, Ill.  
 Garrison, A. Fdry. Co., Pittsburgh, Pa.  
 Robinson-Rea Mfg. Co., Pittsburgh.  
 Seaman, Sleeth & Black, Pittsburgh.  
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel.**  
 Birmingham Iron Foundry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 East Chicago Fdy. Co., Chicago, Ill.  
 Garrison, A. Fdry. Co., Pittsburgh, Pa.  
 Robinson-Rea Mfg. Co., Pittsburgh.  
 Seaman, Sleeth & Black, Pittsburgh.  
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

**Roofing.**  
 Berlin Iron Bridge Co., E. Berlin, Conn.  
 Cincinnati Corrugating Co., Piqua, O.  
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

**Rope and Web Goods.**  
 Covert Mfg. Co., West Troy, N. Y.  
 Covert's Saddlery Wks., Farmer, N. Y.

**Rope Wheels.**  
 Cresson, Geo. V. Co., Philadelphia, Pa.

**Rubber Goods.**  
 Canfield, H. O., Bridgeport, Conn.

**Rules, Manufacturers of.**  
 Stanley Rule & Level Co., 29 Chambers, Stephens & Co., Riverton, Conn.

**Sad Irons.**  
 Enterprise Mfg. Co., Phila., Pa.  
 Streeter, N. R. & Co., Groton, N. Y.

**Sad Irons, Gas.**  
 Bolgiano Mfg. Co., Baltimore, Md.

**Sand Paper.**  
 Baeder, Adamson & Co., Phila., Pa.

**Sash Balances.**  
 Caldwell Mfg. Co., Rochester, N. Y.  
 Fullman Sash Balance Co., Rochester, N. Y.

**Sash Cords and Chains.**  
 Morton, Thos., 65 Elizabeth, N. Y.  
 Samson Cordage Works, Boston, Mass.  
 Smith & Egg Mfg. Co., Bridgeport.

**Sash Pulleys.**  
 Palmer Hardware Mfg. Co., Troy, N. Y.

**Sash Weights.**  
 Brown, E. E. & Co., Philadelphia, Pa.  
 Kings County Iron Foundry, Brooklyn, N. Y.  
 Norton Bros., Chicago, Ill.

**Saw Filing Machines.**  
 Diston, Henry & Sons, Philadelphia, Pa.

**Saws, Makers of.**  
 Atkins, E. C. & Co., Indianapolis, Ind.  
 Diston, Henry & Sons, Phila., Pa.  
 National Saw Co., Newark, N. J.  
 Simonds Mfg. Co., Fitchburg, Mass.

**Saw Sets.**  
 Taintor Mfg. Co., 84-86 Chambers, N. Y.

**Saw Vises.**  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Sawing Machines.**  
 Q. & C. Co., Chicago, Ill.

**Scales, Manufacturers of.**  
 Buffalo Scale Co., Buffalo, N. Y.  
 Chatillon, John & Sons, 38-40 Chit, N. Y.  
 Standard Scale & Fixtures Co., St. Louis, Mo.

**Scrapers, Road.**  
 Sidney Steel Scraper Co., Sidney, O.

**Screens, Coal and Ore.**  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

**Screw Cutting Machinery.**  
 Wells Bros. & Co., Greenfield, Mass.  
 Wiley & Russell Mfg. Co., Greenfield Mass.

**Screw Drivers.**  
 Brown, R. H. & Co., New Haven, Conn.  
 Mayhew, H. H. Co., Shelburne Falls, Mass.

**Screw Machinery.**  
 Hartford Machine Screw Co., Hartford, Conn.

**Screw Plate and Pipe Cutter.**  
 Jarlecki Mfg. Co., Erie, Pa.

**Screws, Makers of.**  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Wm. H. Haskell Co., Pawtucket.  
 Miles, F. S., 205 Quarry, Philadelphia.  
 Reynolds & Co., New Haven, Conn.  
 Worcester Machine Screw Co., Worcester, Mass.

**Scroll Saws.**  
 Barnes, W. F. & John, Rockford, Ill.  
 Millers Falls Co., 93 Read St., N. Y.  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Scythe Stones and Whetstones.**  
 Pike Mfg. Co., Pike Statn., N. H.  
 Cleveland Stone Co., Cleveland, O.

**Shafting, Makers of.**  
 Brown, A. & F., 17 Dey St., N. Y.  
 Cresson, Geo. V. Co., Philadelphia, Pa.  
 Fairmount Mch. Co., Philadelphia, Pa.  
 Sellers, Wm. & Co., Inc., Phila., Pa.  
 Stow Mfg. Co., Binghamton, N. Y.

**Shaped Iron and Steel, Manufacturers of.**  
 Aetna-Standard Iron & Steel Co.,  
 Bridgeport, O.,  
 Pittsburgh, Pa.  
 The Treadaway Mfg. Co., Pittsburgh, Pa.  
 Waterbury Farrel Foundry & Mch. Co., Waterbury Conn.

**Allentown Rolling Mill.** Allentown, Pa.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
**Passaic Rolling Mill Co.** Paterson, N.J.  
The Phoenix Iron Co., Phila., Pa.  
**Pottsville Iron & Steel Co.** Pottsville, Pa.  
Roberts, A. & P. & Co., Phila., Pa.

**Shears and Scissors.**  
Acme Shear Co., Bridgeport, Conn.  
Claus Shear Co., Fremont, Ohio.  
Heinrichs, R. Sons Co., Newark, N.J.

**Sheet Iron and Steel, Manufacturers of.**  
Alta-Standard Iron and Steel Co., Bridgeport, O.  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
Jersey City Galvanizing Co., 112 John St., N.Y.  
Mahoning Valley Iron Co., Livingston, Ohio.  
Morehead-McCleane Co., Pittsburgh.  
Pierson & Co., 29 Broadway, N.Y.  
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.  
The Mahoning Valley Iron Co., Youngstown, O.  
Alan Wood Co., Philadelphia.  
W. Dewees Wood Co., McKeesport, Pa.

**Sheet Zinc.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Shelf Brackets.**  
Atlas Mfg. Co., New Haven, Conn.  
Stanley Works, New Britain, Conn.

**Shoe Stands.**  
Kuperle, Jno. C., St. Louis, Mo.

**Shovels.**  
Peninsular Metal Works, Detroit, Mich.

**Show Cases.**  
Union Show Case Co., Chicago, Ill.

**Sinks.**  
Douglas, W. & B., Middletown, Conn.

**Skate Grinding Machinery.**  
Perkins, Chas., Bridgewater, Mass.

**Skates, Ice.**  
Barney & Berry, Springfield, Mass.  
Keene Mfg. Co., Keene, N.H.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

**Skates, Roller.**  
Henley, M. C., Richmond, Ind.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

**Slag Machines.**  
Cambria Iron Co., Johnstown, Pa.

**Slaw Cutters.**  
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

**Smelting Works.**  
Reeves, Paul S., 760 S. Broad, Phila.

**Soldering Coppers.**  
Cleneden Bros., Baltimore, Md.  
Covert Mfg. Co., West Troy, N.Y.

**Speaking Tubes.**  
Ostrander, W. R. & Co., 204 Fulton St., N.Y.  
Wollensak, J. F., Chicago, Ill.

**Special Machinery.**  
Rhodes, L. E. Co., Hartford, Conn.

**Spelter.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Spoons and Forks.**  
Boardman, L. & Son, New Haddam, Conn.  
Holmes & Edwards Silver Co., Bridgeport, Conn.  
Rogers, The Wm. Mfg. Co., Hartford, Conn.

**Sporting Goods.**  
Hartley & Graham, 313-315 B'way, N.Y.

**Springs.**  
Clark & Cowles, Plainville, Ct.  
Collett Wire Belting Co., Jersey City, N.J.  
Dunbar Bros., Bristol, Conn.  
Miller & Wan Winkle, Brooklyn, N.Y.  
Morgan Spring Co., Worcester, Mass.  
Roland, Wm. & Harvey, Phila., Pa.  
Sabin Machine Co., Montpelier, Vt.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.

**Spring Hinges.**  
Bommer Bros., Brooklyn, N.Y.  
Chicago Spring Butt Co., Chicago, Ill.  
Pullman Sash Balance Co., Rochester, N.Y.  
Stover Mfg. Co., Freeport, Ill.  
Van Wagoner & Williams Hdw. Co., 14 Warren St., N.Y.

**Stamping Works.**  
Avery Stamping Co., Cleveland, O.  
Cleveland Stamping & Tool Co., Cleveland, O.

**Staples.**  
Cobb & Drew, Plymouth, Mass.  
Titchener, E. H. & Co., Binghamton, N.Y.

**Steam Gauges.**  
Bristol Co., Waterbury, Conn.  
Star Brass Mfg. Co., Boston, Mass.

**Steam Hammers, &c., Makers of.**  
Dienelt & Eisenhart, Philadelphia.  
Dudgeon, Richard, 24 Columbia Street, N.Y.  
Trethewey Mfg. Co., Pittsburgh, Pa.  
Wood, Wm. H., Media, Pa.

**Steam Heating & Oil Separators.**  
Webster, Warren & Co., Camden, N.J.

**Steam Separators.**  
Harrison Safety Boiler Wks., Phila., Pa.  
Webster, Warren & Co., Camden, N.J.

**Steam Specialties.**  
D'Este & Seeley Co., Boston, Mass.  
Lunkenheimer Co., Cincinnati, O.

**Steam Traps.**  
D'Este & Seeley Co., Boston, Mass.

**Steel, Cold Rolled Strip.**  
Superior Steel Co., Pittsburgh, Pa.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Steel Figures and Alphabet.**  
Hoefig, C. W., 52 Fulton St., N.Y.  
Krogsrud, W., 61 Fulton St., N.Y.

**Steel Lumpers.**  
Abbott, Wheelock & Co., N.Y. and Boston.  
Hobson, Francis, Seaman & Co., 97 John St., N.Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N.Y.  
Milne, A. & Co., 1 Broadway, N.Y.  
Newton & Shipman, 83 John, N.Y.  
Wetherell Bros., 93 Liberty St., N.Y.  
Whitmyre, A. R. & Co., B'dway, N.Y.  
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River N.Y.

**Steel (Mushers) Special.**  
Jones, E. M. & Co., Boston.

**Steel Manufacturers.**  
Alta-Standard Iron & Steel Co., Bridgeport, O.  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Boker, Hermann & Co., 103 Duane St.  
Carbon Steel Co., Pittsburgh, Pa.  
Chester Steel Castings Co., Phila., Pa.  
Chrome Steel Works, Brooklyn, N.Y.  
Crescent Steel Co., Pittsburgh, Pa.  
Frankford Steel Co., Philadelphia.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Hobson, Francis, Seaman & Co., 97 John St., N.Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N.Y.  
Kayser, Ellison & Co., Sheffield, Eng.  
La Belle Steel Co., Pittsburgh, Pa.  
Landon Iron Co., Salisbury, Conn.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Moorehead-McCleane Co., Pittsburgh, Pa.  
Moss, F. W., 83 John, N.Y.  
Pottsville Iron and Steel Co., Pottsville, Pa.  
Bowland, Wm. & Harvey, Frankford, Philadelphia.  
Singer, Nimick & Co., Pittsburgh.  
Superior Steel Co., Pittsburgh, Pa.  
Valley Steel Co., St. Louis, Mo.  
Wordlaw, S. & Co., Sheffield, Eng.  
Wetherell Bros., 93 Liberty, N.Y.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Steel, Manufacturers' Agents.**  
Barth, C. K. & Co., Philadelphia, Pa.  
Butts, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N.Y.  
Lindsay, Jas. G. & Co., Phila., Pa.  
Pierson & Co., 29 Broadway, N.Y.

**Steel Rails, Manufacturers of.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Iron Co., Johnstown, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Riverside Iron Wks., Wheeling, W. Va.

**Steel Tool.**  
Frankford Steel Co., Philadelphia, Pa.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N.Y.  
Jones, B. M. & Co., Boston, Mass.  
La Belle Steel Co., Pittsburgh, Pa.

**Step Ladders, Rolling.**  
Bicycle Step Ladder Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co.  
Holyoke, Mass.  
Croissant, M., Albany, N.Y.

**Stocks and Dies.**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Oster Mfg. Co., Cleveland, O.  
Saunders' Sons, D., Yonkers, N.Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Stone Saws and Planers.**  
Lincoln Iron Works, Rutland, Vt.

**Stone Fixtures.**  
Wernicke Co., Minneapolis, Minn.

**Stove Linings.**  
Ostrander Fire Brick Co., Troy, N.Y.

**Stove Pipe Thimbles.**  
Cheney, S. & Son, Manlius, N.Y.

**Stove Trucks.**  
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

**Street Lamps.**  
Steam Gauge & Lantern Co., Syracuse, N.Y.

**Structural Iron Work.**  
Berlin Iron Bridge Co., East Berlin, Conn.  
Lindsay, Jas. G. & Co., Phila., Pa.

**Structural Tubing.**  
National Structural Tubing Co., Potter Bldg., N.Y.

**Sulphuric Acid.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Tacks, Brads, Staples, &c.**  
Atlas Tack Corporation, Boston, Mass.  
Chess Bros., Pittsburgh, Pa.  
Cleneden Bros., Baltimore, Md.  
Cobb & Drew, Plymouth, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.  
Shelton Co., Birmingham, Conn.

**Tack and Nail Machinery.**  
Kimball Bros. & Co., Brockton, Mass.  
Sweetser, W. A., Brockton, Mass.

**Tanks.**  
Stuart & Peterson Co., Phila., Pa.

**Taps and Dies.**  
Butterfield & Co., Derby Line, Vt.  
Carpenter, J. M., Tap & Die Co., Pawtucket, R.I.  
Manning, Maxwell & Moore, 111 Liberty St., N.Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Testing Laboratories.**  
Riehle Bros. Testing Mach. Co., Philadelphia.

**Testing Machines.**  
Riehle Bros. Testing Mach. Co., Philadelphia.

**Theatrical Hardware.**  
Wollensak, J. F., Chicago, Ill.

**Thill Springs.**  
Frost Thill Spring Co., Boston, Mass.  
Sabin Machine Co., Montpelier, Vt.

**Thrust Collars.**  
Gouverneur Mach. Co., Gouverneur N.Y.

**Tire Record.**  
Scattergood, H. W., Phila., Pa.

**Tin Plate Machinery.**  
Lloyd Booth Co., Youngstown, Ohio.

**Tire Upsetters.**  
Butts & Ordway, Boston, Mass.

**Toe Calks, Steel.**  
Burke, P. F., Boston, Mass.

**Tool Chests.**  
Am. Tool Co., 200 W. Houston St., N.Y.

**Tool Holders.**  
Armstrong Bros. Tool Co., Chicago, Ill.

**Tools.**  
Brown, R. H. & Co., New Haven, Conn.  
Leavitt Mch. Co., Orange, Mass.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Millers Falls Co., 93 Readie, N.Y.  
Richardson, C. F. & Son, Athol, Mass.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers.  
Starrett, L. S., Athol, Mass.  
Stearns, E. C. & Co., Syracuse, N.Y.  
Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.

**Tools, Blacksmith and Wheelwright.**  
Buffalo Forge Co., Buffalo, N.Y.  
Butts & Ordway, Boston, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Oster Mfg. Co., Cleveland, Ohio.  
Plumb, Payette R., Philadelphia, Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Tools, Steam and Gas Fitters'.**  
Saunders' Sons, D., Yonkers, N.Y.

**Torches, Oil and Gasoline.**  
Dangler Stove & Mfg. Co., Cleveland, O.  
Schaefer & Trenkamp Co., Cleveland, Ohio.  
Standard Lighting Co., Cleveland, O.

**Tote Boxes.**  
Clark, W. J. & Co., Salem, O.

**Tranom Litter.**  
Wollensak, J. F., Chicago, Ill.

**Tree Holders.**  
Allentown Hdw. Works, Allentown, Pa.  
Logan & Strowbridge Iron Co., New Brighton, Pa.

**Trucks, Manufacturers of.**  
Clark, G. F., Windsor Locks, Conn.

**Tubes, Seamless Drawn Copper.**  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N.Y.  
Randolph & Clowes, Waterbury, Conn.

**Tube, Steel.**  
Every Stamping Co., Cleveland, O.  
Leng's, John S. Son & Co., & Fletcher St., New York.  
U.S. Projectile Co., Brooklyn, N.Y.

**Tubing, Structural.**  
National Structural Tubing Co., Potter Bldg., N.Y.

**Tumbling Barrels.**  
Henderson Bros., Waterbury, Conn.

**Turnbuckles.**  
Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E.D.

**Twist Drills, Makers of.**  
Cleveland Twist Drill Co., Cleveland, Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Standard Tool Co., Cleveland.

**Valves, Gas, Water and Steam.**  
Chapman Valve Mfg. Co., Boston, Pa.  
Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., 71 John, N.Y.  
Lunkenheimer Co., Cincinnati, O.  
McNab & Harlin Mfg. Co., 60 John, N.Y.

**Ventilating Fans.**  
Perkins, B. F. & Son, Holyoke, Mass.

**Ventilator Appliances.**  
Howard & Morse, 46 Fulton St., N.Y.

**Vise Jaws.**  
Newark Mch. Tool Co., Newark, N.J.

**Vises.**  
Hollands Mfg. Co., Erie, Pa.  
Howard Iron Works, Buffalo, N.Y.  
Millers Falls Co., 93 Readie St., N.Y.  
Parker, Chas. Co., Meriden, Conn.  
Prentiss Vise Co., 44 Barclay, N.Y.

**Wagon Jacks.**  
Covert Mfg. Co., West Troy, N.Y.  
Covert's Saddlery Works, Farmer, N.Y.

**Washers.**  
Haskell, Wm. H. Co., Pawtucket, R.I.  
Milton Mfg. Co., Milton, Pa.  
Sternbergh, J. H. & Son, Reading, Pa.

**Washing Machines.**  
Richmond Cedar Wks., Richmond, Va.

**Water Meters.**  
Worthington, Henry R., 86 & 88 Liberty St., N.Y.

**Water Wheels.**  
Poole, Robt. & Son Co., Baltimore, Md.

**Wheelbarrows.**  
Bryan Mfg. Co., Bryan, Ohio.  
Sidney Steel Scraper Co., Sidney, O.  
Withington & Cooley Mfg. Co., Jackson, Mich.

**Window Cord, Makers of.**  
Samson Cordage Works, Boston, Mass.

**Wire, Manufacturers of.**  
Cincinnati Barb Wire Fence Co., Cincinnati, O.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Miller & Van Winkle, Brooklyn, N.Y.  
New Castle Wire Nail Co., New Castle, Pa.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Salem Wire Nail Co., Salem, O.  
Stewart Wire Co., Easton, Pa.  
Trenton Iron Co., Trenton, N.J.  
Washburn & Moen Mfg. Co., Worcester, Pa.  
Wetherell Bros., 93 Liberty St., N.Y.  
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Wire Cloth.**  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Darby, Edward & Sons, Philadelphia.  
Estey, W. S., 65 Fulton, N.Y.  
Gilbert & Bennett Mfg. Co., 42 Cliff.  
Howard & Morse, 45 Fulton, N.Y.  
Ludlow-Saylor Wire Co., St. Louis, Mo., N.J. Wire Cloth Co., Trenton, N.J.  
New York Wire Cloth Co., 102 Chambers St., N.Y.  
Scheeler & Sons, Buffalo, N.Y.  
Wickwire Bros., Cortland, N.Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.  
W. S. Tyler Wire Works Co., Clevedon.

**Wire Cutters.**  
Higganum Hdw. Co., Higganum, Conn.  
King, J. M. & Co., Watertown, N.Y.

**Wire Dies.**  
McFarland, Wm., Trenton, N.J.  
Newton & Shipman, 83 John St., N.Y.

**Wire Dowels.**  
Bond Nail Co., Raynham, Mass.

**Wire Fences, See Fencing, Iron and Wire.**

**Wire Goods, Manufacturers of.**  
Darby, Edward & Sons, Phila.  
Gilbert & Bennett Mfg. Co., 42 Cliff, N.Y.

**Wire Hangers.**  
Barber-Koenig Mfg. Co., Hazleton, Pa.

**Wire Machinery.**  
Am. Tool Wks., Cleveland, O.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Morgan Construction Co., Worcester, Mass.  
Waterbury Mch. Co., Waterbury, Conn.

**Wire Nails.**  
Indiana Wire Fence Co., Crawfordsville, Ind.  
Kilmer Mfg. Co., Newburg, N.Y.  
New Castle Wire Nail Co., New Castle, Pa.  
Salem Wire Nail Co., Salem, O.  
Taunton Wire Nail Co., Taunton, Mass.  
Whitney, A. R. & Co., New York City.

**Wire Rods, Steel.**  
New Castle Wire Nail Co., New Castle, Pa.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Whitney, A. R. & Co., 17 B'way, N.Y.  
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N.Y.

**Wire Rope, Iron and Steel, Makers.**  
Broderick & Bascom Rope Co., St. Louis, Mo.  
California Wire Works, San Francisco.  
Hazzard Mfg. Co., Wilkes-Barre, Pa.  
A. Leach & Sons Rope Co., St. Louis.  
Trenton Iron Co., Trenton, N.J.  
Washburn & Moen Mfg. Co., Worcester, Mass.

**Wire Rope Machinery.**  
Kay, J. F., Passaic, N.J.

**Wire Straightening and Cutting Machinery.**  
Adt, John & Son, New Haven, Conn.

**Wood Turning.**  
Cleveland Wood Turning Co., Cleveland, O.

**Wood-Working Machinery.**  
Fay, J. A. & Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N.Y.

**Wrenches, Manufacturers.**  
Bemis & Call Hardware & Tool Co., Springfield, Mass.  
Billings, Spencer & Co., Hartford, Conn.  
Coes Wrench Co., Worcester, Mass.  
Trimont Mfg. Co., Roxbury, Pa.  
Walworth Mfg. Co., Boston, Mass.

**Wringers.**  
Colby Wringer Co., Montpelier.  
National Wringer Co., Canton, O.

**Yacht Hardware.**  
Ferdinand, L. W., & Co., Boston, Mass.

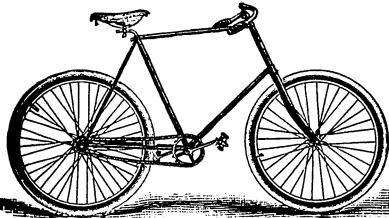
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Loyd, John.....	66	Pancoast, Henry B. & Co.....	42	Seneca Falls Mfg. Co.....	46 & 66	Vulcan Iron Works.....	25
Ludlow-Saylor Wire Co.....	7	Parker, Chas. Co.....	78	Sessions Foundry Co.....	23	Walker Mfg. Co.....	24
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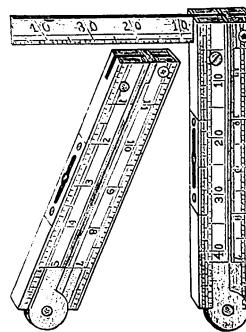
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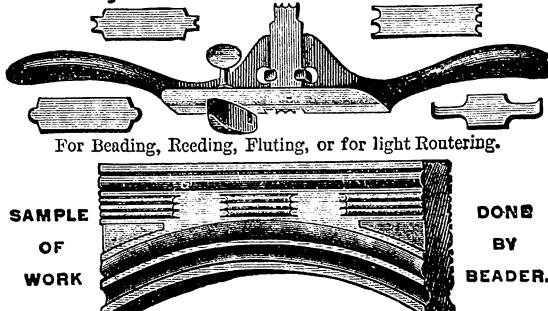
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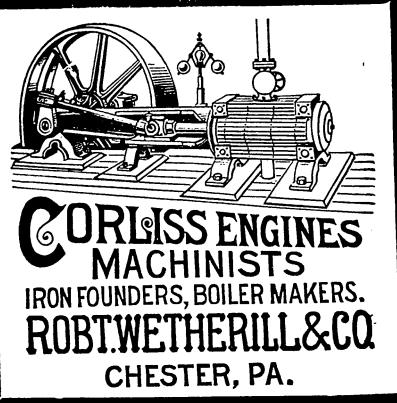
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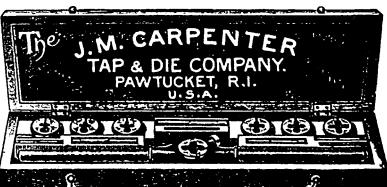
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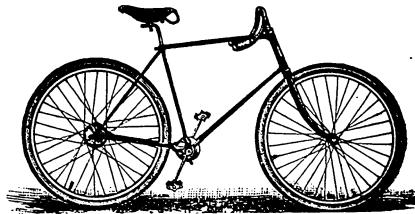
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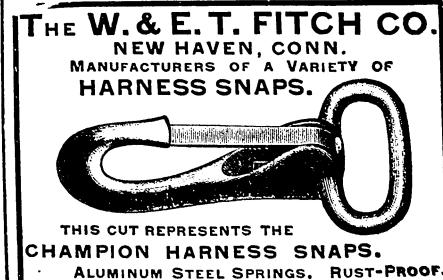
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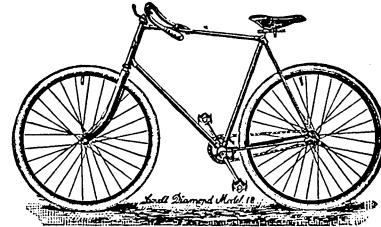
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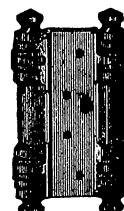
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# THE IRON AGE

THURSDAY, NOVEMBER 8, 1894.

## A Fifteenth Century Gun.

In these days of modern ordnance it is always an interesting sight to come across specimens of guns of the style in vogue 400 or 500 years ago. What we call modern high power guns to-day have to look back two or three centuries for their prototypes as far as their built-up feature is concerned, for one finds both at Ghent, in Belgium, and at Edinburgh Castle a type of gun that may well be called the great great grandparent of the present system. The production of to day in gunnery as in other walks of life is rather more rapid than his ancestor, and in many features bears but little resemblance to the parent tree. Breech loading has almost entirely supplanted muzzle loaders, although we occasionally find guns of unknown age having a rude attempt at

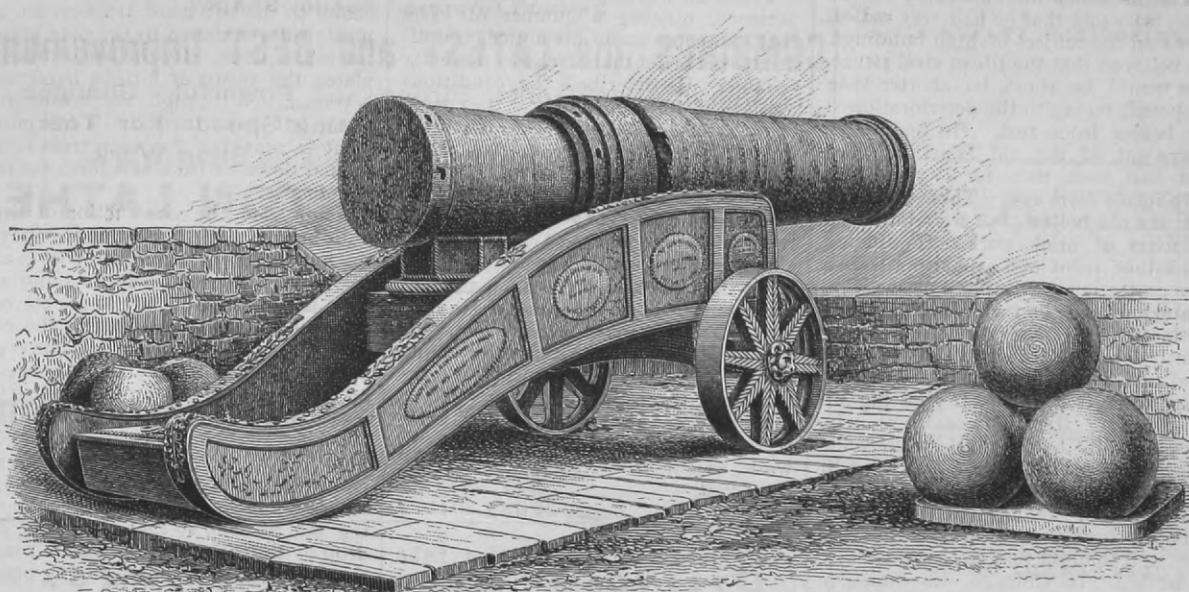
Simon de Lalaing after a memorable siege in which the gun played a very prominent part.

It is composed of welded grooved plates which form the body or tube of the gun. Over these are placed about 60 massive hammered iron hoops to bind the whole together. The length of the gun is 15 feet 9 inches, and its muzzle diameter is 34½ inches, the caliber being about 2 feet. The arms of Philip the Good are also to be seen near the breech end of the piece. Immense stone balls were the usual projectiles fired, although occasionally other material was used. The charge of powder was very much smaller in proportion to the projectile than we used when we gave up our smooth bores, and consequently the muzzle velocity was not great, but that it was sufficient for the purposes intended was well proven whenever the gun was brought to bear. So much

up system and is composed of long iron bars held together by iron hoops. It is 13 feet long and 20 inches in diameter. It weighs upward of 5 tons, and in the days of its activity one of the features of campaigns in which it was entered was its transportation from place to place, and many an interesting story is told of the breakdowns and makeshifts necessary to get it to the front in time to play its part.

## Storage Battery Locomotive.

Norton Bros. of Maywood, Ill., are using in their tin plate factory an electric locomotive deriving its propelling power from a storage battery. The locomotive displaces hand labor in pulling small cars loaded with tin plate from one part of the factory to another. The plant consists of a number of de-



"MONS MEG," A FIFTEENTH CENTURY GUN.

breech loading, and I think at the Naval Academy there is a murdering piece of bronze that was used by Cortez in Mexico that had a breech loading arrangement. But the imperfect loading and accidents due to escaping gas and blowing out of breech blocks induced the change back to muzzle loaders, and we find them casting guns of this type in Belgium before the fifteenth century, and also at the same foundry making the various parts for use with the built up guns.

A number of these guns were shipped to various parts of the world where places were being besieged and from their size and the battering down powers they possessed were considered marvels of efficiency. The famous gun of Belgium was named Mad Meg. In those days, and even as late as our civil war, it was the custom to name guns of unusual caliber or that had borne a prominent part in action. Mad Meg was cast in the early part of the fifteenth century and among other services may be mentioned the siege of Audenarde in 1452. The place was besieged by the citizens of Ghent, who were repulsed by

were these huge pieces dreaded that one is reminded of the coon story in which the animal beseeches the huntsman not to shoot, "I'll come down."

Mons Meg is the name of the other famous piece of ordnance, and this was also built up in Belgium. It forms a prominent object on top of the King's Bastion at Edinburgh Castle. It belongs to the Meg family and gets its Christian name from the fact of its having been made at the town of Mons in 1476. From this we can see that it is some years younger than Mad Meg, and is considered as being an improvement.

It was in prominent service in 1489, when James the Fourth used it at the siege of Dumbarton, and about a dozen or so years later it was blazing away at the siege of Norham Castle, on the Borders. Some hundred years afterward, in 1682, it burst when a salute was being fired in honor of the Duke of York. In 1754 it was removed to the Tower of London, where it remained until 1829. Sir Walter Scott interested himself in the gun and had it removed to Scotland, where it now remains.

Mons Meg is also made on the built-

tched buildings, and the magnitude of the operations compelled the adoption of some sort of mechanical power in transferring the heavy material between the several departments. A storage battery locomotive was decided to be the best adapted to the peculiar requirements of the work, and the firm of Pierce & Richardson, Manhattan Building, Chicago, prepared the design and supervised the installation, the battery being the work of Frederick L. Merrill. It is stated that the locomotive has worked so satisfactorily that Norton Bros. contemplate the addition of others.

The locomotive is built of wood, but strongly constructed. It is 5 feet in length, 30 inches in width and 44 inches in height. Its weight is about 5000 pounds, and its four wheels are 20 inches in height. The battery consists of 24 chloride cells, and is placed in the upper portion of the locomotive under cover. The motor is mounted on a McGuire truck, and develops 4 horse-power at 50 volts but is capable of running up to 6 horse-power at 80 volts. The locomotive has pulled five

cars weighing over 8000 pounds on a track not in the best condition. The cells of the battery have been found to endure jarring or bumping satisfactorily. The battery is charged on the premises from a generator which is also used for supplying power to motors running machines in various portions of the plant. A wire is run from the generator to a number of points along the track, at which the battery can be charged whenever the locomotive is standing, thus keeping its efficiency constant.

### Steel in High Buildings.

During the recent annual convention of the American Institute of Architects, a discussion was had on the use of steel in high structures. It was brought out by the reading of a paper by T. M. Clark, entitled "Protection Against Fire; the Architect's Attitude and Duty; Skeleton Construction in Its Relation to the Fire Department in Boston." The *Engineering Record* prints the following report:

The discussion was opened by Geo. B. Post, who said that he had very radical views on the subject of high buildings. He believed that the life of steel structures would be short, far shorter than supposed, owing to the deterioration of the beams from rust. He had taken beams out of the old *Times* Building that had been there for 35 years that were rotten from rust. These had been over the old boilers, but were buried in 8 inches of brick work. He did not think that paint and asphaltum were a sure protection. All plate beams were laminated, and the rust splitting off the laminations a fresh surface was constantly exposed. He admitted that steel rusted less than wrought iron, but more than cast iron. In putting up buildings of the cage construction he always built the cage inside (the walls being anchored to it), so that it could be readily inspected.

W. L. B. Jenney believed that wrought iron was as durable as cast iron, and thought that steel was equally as lasting. In Chicago the difficulty was, not to protect against fire—that they could do—but against the firemen. He cited the case of the Athletic Club fire, where the terra cotta walls were almost at a white heat when the streams of water were applied. He had found that wire lath covered with any good wall cement stood fire and water tests admirably. For external fire protection he thought porous terra cotta very good, providing the anchors were well covered. For internal protection of warehouses where inflammable goods are stored he suggested putting on a second lining of fire proofing.

C. H. Blackall suggested a plan for protecting externally by the use of a water curtain flowing over the walls.

Mr. Robinson thought the design of high buildings was more of a utilitarian problem than an artistic one. He objected to cast iron, as engineers had found it impossible to devise any satisfactory scheme for inspecting it.

Mr. Post then said that he was able to get satisfactory cast iron columns and satisfactory tests. He believed in using it in part, together with steel. He did not think that the question of elevator space was a serious one now, since the electric elevators were coming into use, and a large saving of space for machinery was effected by their use, as they took not more than one third the space taken by hydraulic elevators.

Mr. Jenney again spoke strongly in favor of steel, and spoke of defects discovered in iron castings in his experience that would not have been developed by any of the usual tests.

Prof. W. H. Burr, on being invited to express his views, stated that he believed in looking at the question from the standpoint of an engineer. Engineers had had so much trouble to get reliable cast iron work that now they used it as little as possible. He cited his experience where apparently reliable castings had given way and sometimes exploded before any load had been applied, owing to the internal strains. Cast iron was all right for pedestal blocks and where used in heavy masses. He was surprised that architects were so willing to use it. While the general impression was that cast iron resists corrosion better than wrought iron, he thought that there was really little difference. Under adverse conditions there was no doubt that wrought iron and steel often corrode very rapidly, but when properly painted and under ordinary conditions this never occurred. He had never seen laminations split off. Structural steel was not laminar.

President Burnham then gave his experience, quoting a number of cases that had come under his notice, and affirmed his belief that steel was perfectly reliable. He described the conditions existing in Chicago, and how they came to use steel footings there. The only danger, he thought, lay in the joints and at the faces of the beams.

In concluding the discussion Mr. Post said that he did not criticise steel so much as he did much of the construction now going on in New York, where the work was put up with apparent recklessness in many cases. He had seen the rain from a northeast gale driven through a brick wall 4 feet thick and run down on the inside of the building. Beams exposed to such moisture would certainly rust very fast. He feared more for rear walls than front walls, as the former were never as well protected.

### Coal Storage at the Head of Lake Superior.

The Lehigh Valley Coal Company are building a coal dock at the head of Lake Superior that for modern methods of building and for automatic appliances is far different from anything that has yet been constructed, and is claimed to be so much better than anything else that it will compel the adoption of a like system elsewhere. Its claims of superiority are that the cost of screening and reloading coal into cars is reduced to 4 or 5 cents a ton, a very important item, and that the coal is stored in less space. It is designed to have two houses of steel for the storage of anthracite and a bituminous pile, the whole with a storage capacity for 130,000 tons of hard and 200,000 tons of soft coal. The work is done under the general plans of the Dodge Coal Storage Company of Nicetown, Philadelphia, and the steel construction is by the Allentown Rolling Mills of Pennsylvania. The anthracite coal will be stored in two great steel buildings of parabolic section, and each 246 feet in diameter. They will be 100 feet high to the top of the cupola, and the coal will be piled 80 feet deep in the center, and 17 feet at the edges. To hold the coal pressure against the sides of the buildings, where all the pressure will come, as the coal is piled in pyra-

midal form from this depth to the center of the house, a wall is built of 4-inch I-beams, spaced 3 feet apart, carrying No. 16 corrugated iron round the inside to a height of 17 feet. To anchor this wall against the tremendous pressure of the coal a continuous band 3 feet high is placed 20 feet inside the circumference of the building, some distance above the floor, and from each I-beam of the wall two rods run to this band. The first coal that is brought into the building comes to a point above this band, and is dropped upon it, the coal itself thus anchoring the band.

The buildings are novel in construction, from the fact that the roofs are held by 12 complete three-hinged arches which intersect at the center. In order to secure a three-hinged arch and thus avoid ambiguity of stresses, it was found necessary to bring the arches into four distinct groups, and by varying the detail of the upper ends or necks, bring the pins of the groups to four different levels. As it was impossible to cross the three arches making up a group, the center arch of each group is carried across in the usual way, while the right hand truss is connected by a pin at the center to the left hand truss on the opposite side, as shown by the plan giving the center lines. By the use of bearing plates the thrust of a right hand truss is transmitted through the center truss to the left hand truss, and a free movement is provided for each truss either up and down or back and forth for several inches.

Aside from the construction of these buildings, which is new, it is believed the method of handling the coal is also new. It is carried into the buildings from the dock front by Bogle conveyors 120 feet high, which lift the coal from the hold of a vessel and convey it back and down to a point in the house 20 feet inside the circumference and 25 feet above the ground. Here it falls on the floor, and when the pile reaches the height of 25 feet it is conveyed on a ribbon in an inclined trough to points where it can be dropped on the ever rising pile of coal, so that after the first drop of the coal it does not fall more than a few inches, thus reducing breakage to a minimum.

After the house is filled it is emptied as automatically as possible. From the center of either building toward a common point on the dock front runs a circular cast iron tunnel, 7 feet in diameter, and sunk below the floor of the house. In each are two endless chains carrying conveyor scrapers, onto the upper side of which discharge steel pipes 15 to 18 inches in diameter and 12 feet apart. These lead from the floor of the house, and it is intended that when opened by pulling a door, the coal shall flow down through them to the endless conveyor, and be carried out and to the top of a small building in which are sets of automatic screens, where the coal is screened and loaded into cars for shipment. To bring the coal, as the quantity in the storage houses diminishes, to the openings in the floor, there are five reloading tracks in concentric circles, on which will travel a Dodge pivotal reloader, provided with chains and flights, which pushes the coal into the holes in the floor. It is expected that the work of loading and screening will be done by half a dozen men outside the machinery force, and that 60 or 70 will be displaced. The buildings will cost not far from \$500,000, and it is hoped to get a little coal into one of them this fall.

### Hydraulic Boiler Plate Bending Machine.

*Engineering*, from which we take the following, states that the machine here illustrated has been designed to overcome the difficulties hitherto experienced in bending to a true circle throughout the heavy plates now used in marine boiler work. When such plates are bent in rolls, the cost of machines sufficiently powerful to deal with plates, say,  $1\frac{1}{2}$  inches in thick-

7 to 12 feet wide by  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches thick. This difficulty was twofold—one to manage the straight long length before the plate was entered, and still more so when, having passed through the dies, it was curved to the radius of the boiler, and 25 to 30 feet of curved plate was in the air. All these difficulties were overcome, at the suggestion of R. H. Tweddell, by placing the girders vertically, as shown in our illustration, and the adoption of the parallel motion for working the moving girder,

perfectly square with it; therefore the boiler plate placed on edge thereon must enter squarely between the dies. Again, as soon as the shop crane has placed the plate in position it is traveled forward by a man and a boy, who press small pinch bars—the ends of which enter small holes cast in the floor plates—against small bars put into the tack holes already in the plate, and thus push it forward. In order to render this work easier, small hardened steel bars or runners about  $\frac{1}{2}$  inch in diameter are placed under the plate, and these run between it and the floor. Thus, after once the plate has entered, the shop traveler is free until required to take the finished plate away.

The machine itself consists of two vertical fixed girders united by a bottom bed plate, and also a top girder. In our illustration it will be seen that a portion of this top girder is moved upward out of its seat. Of course when the plates are being bent this bolt is secured to the outer girder, the object of its being removable being to allow plates bent to a small diameter to be drawn up over the front girder when finished.

The inner edge of the outermost girder, as will be seen by the sectional plan, Fig. 2, is convex, while the opposite edge of the moving girder is concave. Hence when the moving girder approaches the other, it bends the plate to a corresponding radius. It has been found in practice that it is not necessary that the dies should meet, having the plate accurately fitting the space between them; it is only necessary that the dies bear on three points, and, by means of a suitable regulating gear, the

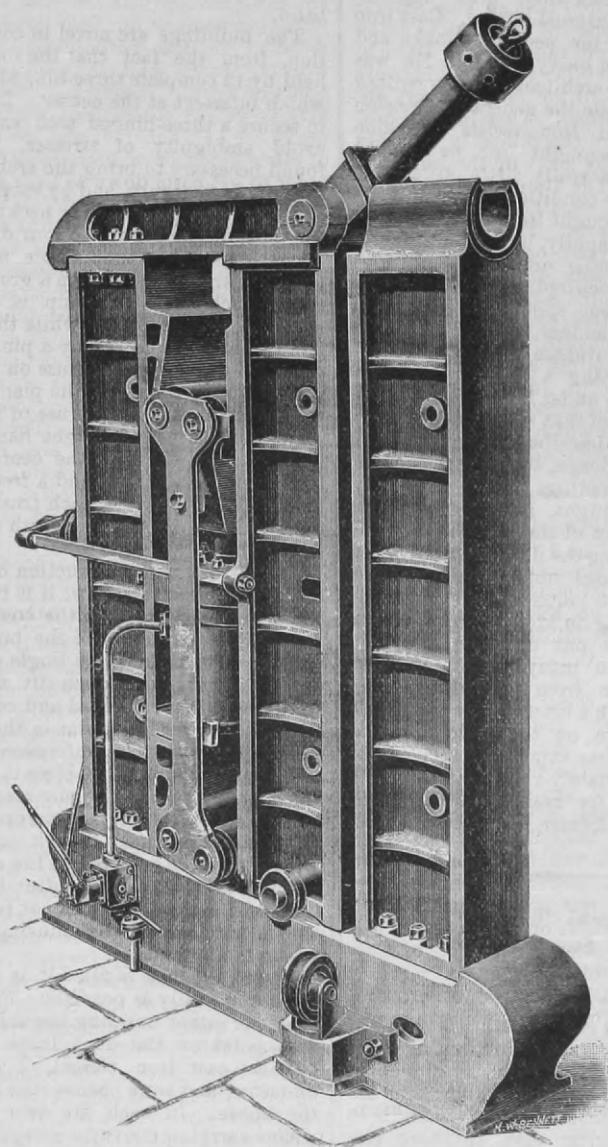


Fig. 1.—Perspective.

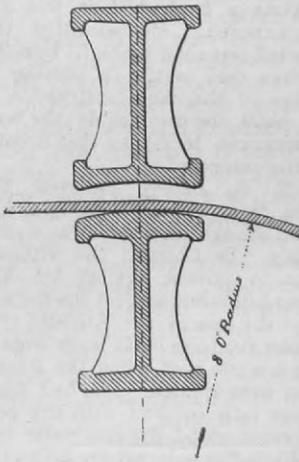


Fig. 2.—Sectional Plan of Bending Surfaces.

### HYDRAULIC BOILER PLATE BENDING MACHINE.

ness, is very great, and the risk of their fracture by overfeeding is very considerable. But apart from this is the difficulty in bending the plate to a true curve at the end which leaves the rolls last.

There is, of course, nothing new in bending plates to a circular form in hydraulic presses, and so far as boiler shell plates are concerned, this was, we believe, first done by Messrs. E. Isingham of South Shields, the well-known boiler makers. They, however, passed the plates through a press on which the dies were placed horizontally, and considerable difficulty was therefore found, not only in insuring the fair entering of the plates, but still more in handling plates 25 to 30 feet in length and from

which, as is well known, is so successfully used in their multiple punching and plate shearing machines by Fielding & Platt of Gloucester, who are patentees with Mr. Tweddell in these inventions and also in the boiler shell bender here illustrated. By the use of this frictionless gear another trouble hitherto experienced in presses which, from their length, require two or more hydraulic rams, was overcome. The difficulty in getting two or more rams on one long girder to travel at the same speed is well known; and this also tended to make untrue work.

By placing the machine vertically, all trouble in entering the plate fairly ceased. The machine is placed on a level flooring of cast iron plates and

exact distance traveled by the moving die, to secure a uniform curvature throughout the plate, is maintained constant during the whole operation. The importance, therefore, of the moving die being always parallel to the outer one is obvious, and this end is secured by means of the parallel motion employed.

The hydraulic cylinder is fixed to the back girder. To the top of the ram is attached a cross head carrying two rollers. By means of two side rods a similar set of rollers are raised simultaneously with the top ones. Two straight facing pieces are on the moving girder, while on the back standard are two inclined planes. The rollers—which, by the way, are in rolling con-

tact with each other and the above bearing surfaces—being pushed up by the rams, force the moving girder forward and press the plate. The return motion is effected by the weight of parts, assisted by a hydraulic cylinder on the back girder. The working valve is shown on the bottom casting, on which also are placed, on either side, the swiveling rollers on which the plate partly travels.

These machines have been made to take in and bend cold steel plates  $1\frac{1}{2}$  inches thick by 18 feet wide. The length of the plate, of course, is unlimited, except by the difficulties of manufacture.

The German Government, which, perhaps, just now takes the lead in adopting any machinery tending to improve the quality and reduce cost of work, has three of these machines, all of the largest size, and Blohm & Voss had one of the first in their works at Hamburg. In England the most successful application is probably that at Messrs. Doxford's boiler yard, at Pallion. Much assistance was afforded to the makers by this firm, who took great interest in seeing that the machine was given all the advantages due to careful consideration in arranging for taking the plates to and from it, and in manipulating them on suitable floor plates. It may be here mentioned that, the machine being self contained, practically no foundations are required.

So far as speed of working is concerned, the largest and thickest steel plates in use can be bent to their final curvature at the rate of from 2 feet to  $2\frac{1}{2}$  feet per minute, and in this machine the plate is only passed through the dies once, and there is no risk of fracture by feeding too quickly. It is a very valuable addition to a boiler yard plant, not only for the heavy class of work to which we have alluded, but also for smaller boilers and their plates. It occupies little space; in fact, at Messrs. Doxford's it stands between the wall columns of their shop, and, unless pointed out, would hardly be noticed. The amount of water used is very small, and as all boiler shops have now hydraulic pressure available, there is no additional outlay necessary on pumps and accumulator. In these benders, the latest addition to the large number of machine tools manufactured by them on the Tweddell system, Fielding & Platt have achieved an undoubted success, and their workmanship and design leave nothing to be desired.

**Mesaba Royalties.**—An effort is to be made by the iron men of the Mesaba range this winter to secure a reduction in the State royalties on ore mined on lands belonging to the State. Already plans have been made under which the members of the new legislature are to be taken over the range and shown the need of reductions. While there is no doubt that the men who are paying State royalties are suffering, there is not much prospect that these royalties can be lessened while the rail rates to the lake are held at their present figure and the original lessees of such mines as the Oliver are getting from 25 to 40 cents above the State royalty of 25 cents. The Oliver is the mine on which the argument on both sides is made, for it is operated by the sub-lessees under a second lease from the State through the Rockefeller Company, the claim being made that they are losing money. The mining men claim that this is proof that royalties are too high, while the other side expect to prove when they get to talking that the assertion that the mine

is losing money is proof that the exorbitant rail rate of 80 cents a ton to Duluth and the sub-royalty of 40 cents, this season cut to 25 cents, should both be cut to a reasonable basis. The mining men will ask a sliding scale of royalty, based on 15 cents at the present price of ore and rising to 25 cents when ore touches something like \$3 at Cleveland. The great profits of the Rockefeller road—the Duluth, Missabe & Northern—arise and will continue to do so from the ore carrying contracts they have with mining companies like the Oliver, the Biwabik, the Franklin and others. The contract price of ore hauling is 80 cents a ton from the mines to Duluth, "providing no other road shall haul ore from any part of the range to any ore port at a less price." Therein lies a possible solution of the difficulty that has not been seen by many of the iron men of the range. The Duluth & Iron Range Road have, practically speaking, no ore hauling contracts. They are busy and will be so for years on ore that belongs to the Minnesota Iron Company, of which they are a sub-concern. It makes no difference to the Minnesota whether they charge 25 cents or \$1 a ton for ore hauling, as whatever profit there is either in mining or shipping goes to the same pocket. The possible result, and that which long headed mining men are even now figuring on, is very plain.

#### Chief Melville's Opinion of the "Columbia" and "Minneapolis."

Geo. W. Melville, in the report of the Bureau of Steam Engineering just issued, makes the following remarks concerning the "Columbia" and "Minneapolis":

While all of these vessels made very successful trials, the greatest interest centered in the "Columbia" and "Minneapolis," from the fact that they were the first ships of any country propelled by triple screws in which a requirement of more than 20 knots an hour was stipulated, and from the fact that the maximum power for which they were designed was greater than that of any war ship afloat or projected at the time, and greater than that of any transatlantic steamer then in service. The fitting of triple screws in these two vessels was brought about by the peculiar conditions of the design of the ship—to be of moderate dimensions, with large coal capacity and exceptional power in order to reach a maximum speed of 22 knots.

At the time the design was made there was nothing of an experimental character, except on a very small scale, to indicate the relative efficiency of propulsion by two or three screws, but the generally recognized opinion was that three screws would be less efficient than two; and working on this theory greater power was given these ships than was found to be necessary for the designed speed, with the result that the "Columbia" and the "Minneapolis" stand unrivaled and unapproached in point of speed by any naval vessel afloat, except those of the torpedo boat class. Although the design was looked upon by many as too big an experiment to make, the success of it has fully vindicated the judgment of the bureau, and paved the way to greater speed in transatlantic steamers; for I am convinced that if the ideal five-day steamer becomes a reality she will be one with triple screws, and that it is in this direction we must proceed if we expect to make an increase in the speed of large cruisers.

#### Indiana Industries.—I.

A representative of *The Iron Age* recently had occasion to visit the natural gas district of Indiana, and while there called upon a number of manufacturing establishments. Although this is regarded as a highly favored region, owing to the abundant supply of nature's choicest fuel, yet it was found that the general depression in business is quite seriously felt even here. Manufacturers complain of ruinous prices, notwithstanding their free fuel, and the restricted demand for their products is reflected in the curtailment of their working forces and the reduction in hours of work. Wages have been cut here as well as in localities where high prices are paid for fuel and economies of other kinds have been instituted in order to get costs down to their equivalent at other points. And yet, in comparison with some manufacturing localities recently visited, there was a general appearance of activity throughout the region with indications that ere long full employment would be found for workmen now idle. The glass industry is gradually working into better shape so far as mere operating is concerned. Plate glass factories, long idle, have started their fires again. The larger towns in the gas belt are making municipal improvements, paving streets, building sewers and enforcing regulations generally that will add much to the appearance of the towns as well as contribute largely to the health and convenience of citizens and visitors.

#### The Future of the District.

Any one who will take the trouble to consider the geographical situation of this district cannot fail to be impressed by the fact that it is centrally located with respect to numerous great markets. The manufacturers of Indiana might be considered as too far west to catch much of the trade of the East, with so many competitors in the intervening territory, but nevertheless they enjoy a fair share of Eastern business. They are within easy reach of the large cities on Lake Erie, and close to Chicago and the Mississippi River cities, while they are specially well favored in their proximity to Louisville, one of the great gateways to the South and its growing trade. Numerous railroads traverse this section, several of the leading trunk lines of the country having built through it long before natural gas was regarded as a practicable fuel. Local roads and feeders of the trunk lines supply almost every nook and corner of the district with transportation facilities.

The utmost care has been taken to husband the gas supply. The extravagance of other gas districts and the rapid exhaustion of the supply have been a warning to Indiana manufacturers, and they are heedful of the lesson. No indications are at present perceptible of a diminution in the supply of gas, and it is expected to hold out for years to come. If it should be exhausted, abundant supplies of high grade coal are near at hand, as well as a great oil field, which has thus far merely been exploited to determine its extent, but has not been seriously drawn upon. Manufacturers and business men are therefore confident that they will be able to permanently maintain any vantage gained through the powerful impetus of free gaseous fuel.

#### Inducements to Manufacturers.

One might suppose that by this time the peculiar advantages of the district

would be relied upon for industrial growth. But inducements are still being offered to manufacturers to locate in this territory. Anderson has done a great deal in this line of late, a cash bonus being paid in addition to a free site and free natural gas. Other towns have also secured important factories, whose owners deem it desirable to obtain greater advantages in manufacturing cost in order to meet the low selling prices now ruling. Marion has been worsted in endeavoring to influence some of these new comers to locate there, because the town was without a fund from which to pay a cash bonus, and the citizens are now raising \$50,000 as a starter. They expect with this amount to be able to enter the race and accomplish important results in further building up their manufacturing industries and increasing their working population. The wisdom of this method of forcing the growth of towns has been often and severely criticised, but it nevertheless goes on and will be continued. It has undoubtedly worked well when managed by prudent business men who exercised scrupulous care in selecting the recipients of their favors. With all the natural advantages offered in this district, it would by no means have attained anything like its present importance in manufactures if additional inducements had not been offered.

#### Tin Plate Works.

In writing of the natural gas district of Indiana the subject of tin plate works comes in the foreground, as so much progress has been made there in this line and further developments are to be expected in the near future.

The American Tin Plate Company, at Elwood, have the largest plant. Their works have been very successful, and until the controversy over wages came up they were run to their utmost capacity. The product of this establishment has thus far been made wholly on orders for special sizes to meet the requirements of large consumers. This class of trade was preferred to the manufacture of standard sizes for jobbers. A new mill, superb in all its appointments, has just been built, but not yet put in operation. It is unusually heavy, to diminish the chance of breakages, and is expected to do fine work, but it will not be started until the wages question is settled. The company will then have ten hot mills, together with the necessary cold mills, shears, doublers, picklers and tinning pots to handle the entire output. At present only two mills are in operation, and these are run merely to supply a few customers who depend solely upon the Elwood Works for their supply of tin plates. It is the opinion of President W. B. Leeds of this company that the manufacture of tin plates should be conducted separately from the manufacture of merchant sheets in order to attain success. The discipline of a tin plate factory is necessarily much more rigid than that of a sheet mill. Every stage of the operation must be most carefully conducted in order to secure high quality in the finished tin plate, and quality must be the objective point to insure commercial success. The Elwood plates under his watchful care have already attained a high reputation.

The Morewood Company's plant, at Gas City, is next in importance. They have six hot mills, with foundations laid for two more mills which are shortly to be added. This plant is also run largely on orders for special sizes

of tin plate. Thus far over 50 different sizes have been made. This would appear remarkable if the fact was not known that Morewood & Co., in Wales, have considerably over 300 sizes passing through their books. The Gas City Works make three kinds of terne plate in addition to tin plate. One of these is hand dipped, having a very heavy coating, another is finished with a mottled surface by the company's own process, and the third has a plain surface. The most rigorous methods are pursued in these works to secure the highest quality possible, thorough inspection following every step in the progress of the steel through the works. As an instance of the economy practiced in these works the fact may be mentioned that the dross from the tinning pots is collected and smelted in a special furnace, by which all the metal is saved except an almost infinitesimal part. This plant was in full operation under an agreement with the workmen to take whatever wages might be agreed upon at other mills.

The Irondale Steel & Iron Company's plant, at Middletown, is the third fully equipped mill in the field. Up to the past week this mill has been running on black plates only, under a contract taken some time since. Two hot mill were in use. Four more mills are now being added, together with the necessary auxiliaries, and they will probably be ready for operation during the coming month. The tinning house is completed and some of the pots are in place, which are probably turning out tin plate by this time. This plant has been very substantially constructed, the mill building being of steel covered with corrugated roofing and siding, while the tinning house is built of brick and iron, the entire works thus being fire proof. The plant is well arranged, all material constantly passing forward until it reaches the shipping department. It is located on the Richmond division of the Panhandle Railroad, from which tracks run into the mill. The company have carefully guarded their interests in the matter of fuel by leasing gas rights in the surrounding territory for a long distance.

New black plate mills and tinning plants are in course of erection at Atlanta, Montpelier and Anderson, but it will be several months before any of these are ready to roll. A new plant is talked of at Elwood, and one is mentioned in connection with Alexandria.

The tin plate industry has called into existence also a class of manufacturers to furnish tinning machinery. The Elwood Iron Works at Elwood, Ford & Donnelly at Kokomo, and the Anderson Foundry & Machine Company at Anderson are all engaged in the business of making tinning pots and rolls, pickling machines, annealing boxes, floor plates, &c. All of them seem to have considerable business of this character.

#### Marion Industries.

The Westerman Natural Gas Iron Company are operating at Marion what they term "the smallest mill with the biggest capacity" in the country. This mill, with two small trains of rolls, has made per annum over 11,000 tons of iron of small sizes. The success of the concern forms a conspicuous example of the result accomplished by adhering to a special class of trade. The company manufacture iron suitable for rivets, bolts, coach screws, carriage work, &c. They have not shut down at any time during the depression for lack of work, but have been able to run steadily to their full capacity, and are now crowded

with orders. While this is their normal condition, they have not been tempted to expand their capacity in order to capture still more business, and consequently every part of the works receives the same watchful care as when they were first started, and the reputation of the product keeps up. This mill works no steel, but runs on iron exclusively.

The Marion Steel & Iron Company celebrated their first anniversary October 23. They began to build their rolling mill in April, 1893, so that the work of construction extended through the panic. Nevertheless, they pushed on and successfully weathered the storm. Although they started at such an inauspicious time, they were able to secure a fair share of business. They have a 10-inch train of rolls and are running at considerably more than half capacity, making bar iron and ovals, and heavy bands and hoops down to No. 16. The president of this company is C. A. Bortz, late of the Maumee mill, at Toledo; W. C. Ely is secretary and treasurer, and Thomas Reed is mill manager.

The Columbia Zinc Works, of which James Latourette is proprietor, are in full operation manufacturing spelter for the general trade, and turning out about three carloads per week, which is principally shipped to consumers east of Marion. The ore is brought from Missouri. Silicate ore has been used hitherto, but an additional furnace has just been completed which will run on jack ore or blende. The new furnace consists of 16 kilns, arranged with eight on each side, and provided with three stacks, of which one is in the center and the others are at the ends. The furnace is 60 feet long, 18 feet high and 12 feet wide, and is expected to add considerably to the output of the works. The product is sold almost entirely for galvanizing purposes.

The Sweet & Clark Mfg. Company have received some benefit from the recent partial revival of activity among the car builders, which enabled them to start up their malleable foundry. Although work of this character has been intermittent, they are now hoping to be able soon to run full handed and on full time. The currycomb department will also be put in operation, the output being disposed of through the American Currycomb Company.

The Marion Stove Company have had a fair year and are now very busy. They make a specialty of the Retort stove, which is a magazine heater for burning any kind of soft coal. The managers of this company have been very successful in pushing their specialty, on account of the thorough manner in which they handle the trade. Analyses of all the leading kinds of soft coal in the country have been carefully and systematically gathered, and the user of one of their stoves is advised how to regulate it so as to burn to best advantage the coal of his locality. The stove, when properly managed, burns soft coal and keeps fire as well as a base burner operates with anthracite. The trade of this company not only covers the soft coal districts of the West and South, but also extends into the soft coal section of Pennsylvania.

The Bruce & Marks Mfg. Company, at Gas City, near Marion, are running but a small force at present, but will shortly employ their usual number of hands in the manufacture of sickles or grass hooks, hay knives and corn knives. They make several varieties of corn knives, but the grass hooks are of the Marks patent design, with double

back, perfectly balanced and the weight equalized on each side of the shank to prevent the usual tendency of the point to drop. The company's facilities for manufacturing are excellent, including heavy power hammers for forging the blades from bar steel.

The Indiana Rubber & Insulated Wire Company of Marion have a large brick factory at Jonesborough, in which a variety of rubber products are made, including pneumatic tires for bicycles.

#### THE KELLY AXE MFG. COMPANY.

At Alexandria, midway between Marion and Anderson, are situated the new works of the Kelly Axe Mfg. Company, formerly of Louisville, Ky. It is the largest plant in the business of manufacturing axes and the only one having free fuel. The company draw their supply of gas from their own well, and also control a good deal of gas producing territory, so that they feel assured as to the future. They make nothing but axes, believing that special attention to one class of goods will produce far better results than a division of interests. The factory at Alexandria is the fourth built by this company. Their first soon proved too small, their second was burned, and the third was abandoned on the transfer of the business to Alexandria. The new factory embodies all the improvements suggested by their long experience in manufacturing. The buildings are substantial brick structures and are placed in the center of a large plat of ground, being laid out with a view to the enlargement of any department. Extensions can thus be made without interfering with manufacturing operations, or compelling perhaps expensive alterations in the original plan. The new factory was first put in operation on July 4, but all the machinery had not then been installed. Additions are, in fact, still in progress, and the working force is being steadily augmented. It is expected that 500 men will be employed when everything now under way is completed. Wages have so far not been reduced by this company. They enjoy a good export trade, and in this connection a notable shipment was made on October 24. A carload of axes was then shipped to New York of which one-fourth was destined to South Africa, one-fourth to Australia, one-fourth to Mexico and one-fourth to Alaska.

At Alexandria are located the great plate glass works of the De Pauw Plate Glass Company, which have just been started up after a long term of idleness. An interesting point in connection with these works is the introduction of the Pittsburgh Crushed Steel Company's crushed steel for grinding plate glass, to take the place of sand. Two pounds of crushed steel costing 30 cents are stated to be equivalent in efficiency to 4 tons of sand costing \$3.20, and the uninjured steel is caught for use afterward, while the sand is worthless. The new abrasive is reported to give perfectly satisfactory results in other respects.

A melancholy sight on the southern outskirts of the same town is the partly built plant of the New Albany Rail Mill Company. The foundations had been partly laid, several heating furnaces built and a portion of the machinery removed from New Albany when the De Pauw failure interrupted the work. Grass and weeds have hidden the foundations, the furnaces are almost in ruins and the machinery is weather-beaten, but the location appears to have been well selected, and the Alexan-

drians have hopes that the company will be reorganized and the works built according to the original plans, which are understood to have contemplated sheet mills.

#### TIN PLATE MAKERS' WAGES.

On Monday, October 29, the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., issued a notice to their idle employees to the effect that operations would be resumed at once. After stating that the wages of common labor will not be reduced the notice continues: "The following reductions will be made on high priced labor, namely: Rollers on tin mill, 30 per cent.; doublers and heaters, 25 per cent. After these reductions, if the same weights are turned out as the average weights made during the last six months, men can still earn wages, a day of eight hours, as follows: Rolling, 30 gauge, 4700 pounds, at \$5.50 per ton, 2240 pounds, \$11.12; less 30 per cent. (\$3.34), \$7.78; less catchers' wages (\$1.75) \$6.03; doubling, 30 gauge, 4700 pounds, at \$2.70, \$5.66; less 25 per cent. (\$1.42), \$4.24; heating, 30 gauge, 4700 pounds, at \$2.48, \$5.17; less 25 per cent. (\$1.29), \$3.88. It is our desire to retain all our old employees, but we shall engage new ones in place of those who are not satisfied with this action." The action of this firm in notifying their employees to resume work or forfeit their positions can be considered as the opening of hostilities between the Amalgamated Association and the Tinned Plate Manufacturers' Association of the United States. It will be remembered that in September a conference was held in Pittsburgh between the above two organizations at which the manufacturers proposed a reduction of 30 per cent. in wages of rollers, 25 per cent. to heaters and about 20 per cent. to other tin house labor. The reason advanced for these reductions in labor was the reduction in the duty on tin plate of 1 cent per pound, or \$20 per ton, which went into effect on October 1, 1894. The Amalgamated Association submitted the matter of the proposed reduction to their members and a vote was taken on it, resulting almost unanimously against accepting the reduction. No counter proposition was made by the workmen, and a shut down of the mills took place, only five or six concerns continuing in operation, these being principally located in the natural gas belt in Indiana. In this connection it should be noted that the tin plate concerns who continued in operation were given to understand by the Amalgamated Association that they would be allowed the benefit of any concessions that might be given to the other manufacturers.

Last week Wallace, Banfield & Co., Limited, of Pittsburgh, posted notices in their Irondale Rolling Mills, at Irondale, Ohio, a copy of which is as follows:

"Owing to a decline of 1 cent per pound in the selling price of tin plate caused by a reduction of 1 cent per pound, \$20 per ton, in the new tariff duty, which took effect October 1, 1894, it is impossible to longer run the mills at former scale of wages. All persons are, therefore, hereby notified that all contracts, &c., will terminate Saturday, October 27, 1894. We invite all our present employees, on or before Tuesday, October 30, to apply to the manager, Mr. Banfield, who will notify them of what, if any, changes have been made in their wages, and

signify to him their intention to accept or refuse the same. The mill will start Monday, November 5, 1894."

The above two concerns are among the largest manufacturers of tin plate in this country, and their announcement that they propose to put their plants in operation at once, and without their old employees if necessary, will doubtless cause other concerns to take similar action in the near future. The outcome of the struggle between the tin plate makers and organized labor will be awaited with considerable interest. A report that a compromise would be agreed upon and a fight averted has been officially denied.

#### THE HOWELL TORPEDOES.

The Naval Bureau of Ordnance recently accepted another lot of Howell torpedoes built by the Hotchkiss Ordnance Company. The Government now has two distinct types of torpedoes, the Howell and the Whitehead, which have been approved by foreign countries. The principal difference between these two types is found in the motive power. The Whitehead employs compressed air, while the Howell depends upon a heavy steel fly wheel run at great speed by a steam turbine, and so arranged as to turn the propeller. This torpedo is of the familiar cigar shape common to the various similar weapons. In some respects its mechanism is simpler than that of the Whitehead. The latter contains six sections or compartments, while the Howell has four, all being distinct and detachable. First comes the nose, as it is called, which contains the firing pin and its connections. Behind it is the head, which carries the explosive charge of gun cotton and the detonator. The nose piece for the sake of safety is screwed on just before firing, and the firing pin is secured by an automatic attachment, but set free while the torpedo is rushing through the water. The diminution of the pressure at the limit of its range releases a spring and locks the firing pin again. The torpedo can be sunk to the bottom by admitting water, or, for experimental purposes, the admission of water can be prevented and the torpedo will rise to the surface.

But it is in the third chamber, where the heavy fly wheel is mounted with its screw gearing, that the most interesting feature is found. The axle projects through the shell on one side, and when the torpedo has been placed in the launching tube a steam motor attached to the latter clutches the fly wheel and, when steam is turned on, spins it up. All subsequent movements are performed automatically until the torpedo strikes and explodes upon the target. The remaining parts of the torpedo consist of the diving mechanism and the rudder.

The use of the fly wheel gives a great advantage in directive power, on account of its resisting any tendency to deflect the torpedo and to keep it pointed just as when it leaves the tube. This relieves it from the necessity of using vertical rudders, which is a gain in simplicity. While the Howell torpedo is more compact and lighter and can therefore carry a larger proportion of explosive to the whole weight of the torpedo, it is claimed that the Whitehead has greater range and velocity. It is reported that in the recent test of the Howell torpedoes now accepted, a speed  $\frac{1}{2}$  knot in excess of the requirements was secured for the prescribed distance of 400 yards.

### The Trimo Nipple Holder.

The Trimo nipple holder, made by the Trimont Mfg. Company of Roxbury, Mass., will hold nipples to cut either right or left hand threads. It holds the pipe firmly and releases instantly when reversing the die. It is adapted for either vise or machine use, and the nipple can be placed or removed without stopping the machine. The collar of this holder is suitable to fit the sleeve of the stock for the size pipe it is intended to hold, thus insuring a straight threaded nipple. When used in a machine the collar surrounds and fits the outside of the thread already cut and the rolls lock on the inside of the pipe, making the hold firm and true.

The construction of the holder will be understood from the engravings, Fig. 1 being a perspective view, Fig. 2 a section through the gripping mechanism and Fig. 3 a perspective view with parts broken away. On the outer end of the shank is formed the triangular cam B. In longitudinal recesses formed in the body are the locking rolls C, which are pressed against the cam faces

and that it has no desire to recruit from the ranks of the American Federation of Labor. On the contrary, its membership will be instructed to continue its affiliation with the American Federation. President Johnson says that for the last 12 months the iron workers of America have been subjected to heavy reductions. Their wages are unsatisfactory and there is a general feeling among iron workers that unless their conditions are bettered a bitter strife between employers and men must be the end.

### Sale of the Chapin Mine.

On the 29th ult. the famous Chapin iron mine was sold by Court Commissioner Hammond of Iron Mountain under foreclosure proceedings to satisfy the claims of the owners of the second mortgage bonds for \$648,771.88. M. A. Hanna of Cleveland was the purchaser, and with the purchase of 50,000 shares of the stock made on May 22 Mr. Hanna and those associated with him are now in full control of the valuable 30-year lease of the Chapin property.

permanent working of the mine. Mr. Hanna secured control of the property May 22, and it has been in operation since that time and will probably be worked to its full capacity in future. The Board of Directors elected at the annual election held June 24 are M. A. Hanna, Silas Hitchcock, Samuel Folsom, C. C. Barton, D. R. Hanna, A. M. Robbins and S. C. Hanna of Cleveland, C. A. Chapin of Niles, Mich., and R. C. Flannigan of Norway, Mich. Mr. Flannigan, as trustee, made the sale of the property. There was a meeting of the stockholders in September, at which it was agreed to offer no opposition to the foreclosure suit which had been begun by the bondholders.

### Conversion of a Steamer Into a Sailing Vessel.

The full rigged sailing ship "Lancing" which arrived recently from Calcutta, and is now in New York harbor, presents the interesting spectacle of a large steamer remodeled and converted into an efficient sailing vessel, a feat which, by shipping men, has always been considered next door to an impos-

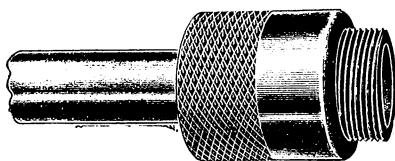


Fig. 1.—Perspective.

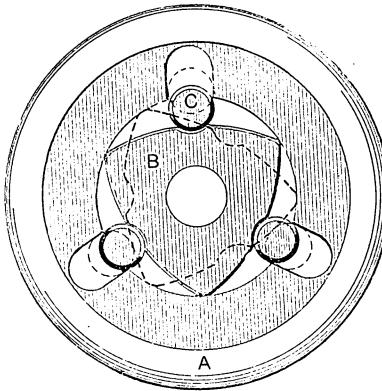


Fig. 2.—Cross Section.

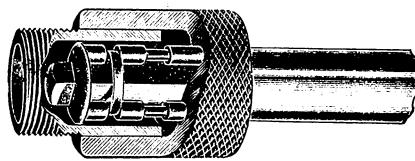


Fig. 3.—Perspective with Part of Shell Broken Away.

### THE TRIMO NIPPLE HOLDER.

by springs. The nipple is introduced between the collar A and these rolls. It is evident that when the collar is moved so that the cam occupies the position indicated by the dotted lines, the three rolls will be forced outward against the inside of the nipple, which will be held firmly between the rolls and collar. Moving the cam in the opposite direction will permit cutting the opposite thread. The greater the strain of cutting the greater the grip on the nipple, as the tendency is to move the rolls toward the outer ends of the cam.

**A New Labor Organization.**—Another ambitious labor organization has sprung into existence. Arrangements were completed at Indianapolis on the 23d ult. for the formation of the Federated Metal Trades of America, as it is to be designated. The new body will include every branch of the iron, brass and steel industries in America. The purpose of the promoters is to bring into a closer relationship all of the national organizations in this branch of labor. The officers of the new association are as follows: President, Lee Johnson of Kansas City, Kan.; vice-president, James O'Connell of Richmond, Va.; secretary-treasurer, William Anderson of St. Louis. The organizers say that it is not the purpose to antagonize any other organization

Mr. Hanna was the only bidder, and the price at which he obtained it and cleared away the claims of the bondholders was \$87,000. Besides the rights of the 30-year lease and all the machinery of the mine, which has cost millions of dollars (the mine having been sold a few years ago by the Van Dykes of Milwaukee to Ferdinand Schlesinger for \$2,000,000 after its profits had made the former owners wealthy), the purchase included a two-thirds interest, or 2000 shares, of the capital stock of the Hydraulic Power Company. This is a separate company, who own and operate the big hydraulic plant by which the power of the falls in the Paint River is used to convey compressed air for running the mines a distance of nearly 6 miles. At the time of its construction this was the largest plant of that description in the world. Three years ago the mine would have readily sold for \$2,000,000, exclusive of the Hydraulic Power Company's plant, which cost over \$500,000. The new owners have come into control through the purchase of 50,000 shares of the Chapin Mining Company stock at \$1 a share, and the purchase of the second mortgage bondholders' claims for only \$87,000. The first and second mortgage bonds have now been wiped out, leaving \$300,000 of third mortgage bonds unpaid.

This purchase practically insures the

sibility. The *Journal of Commerce* says that in remodeling her from a steamer to a ship her holds were gutted and made into 12 water tight compartments, which give to the vessel all the elements of safety and strength peculiar to that class of construction. She is 375 feet long, 45 feet beam and is of 2600 net tons. She is fitted with steam winches, windlasses, &c., and as a protection against fire has steam pumps capable of throwing 100 tons of water an hour. She carried on her last trip to Calcutta 100,000 cases of oil, and out of this large amount only 33 cases were damaged in any way whatever on reaching their destination, which shows that a steamer model is well adapted to sail if the reconstruction be carried on with scientific principles and that the movement of the vessel is steady and adapted to miscellaneous cargoes. The ship was built by Sir William Pierce at the famous Farfield yards, and originally cost \$864,000. The "H. Bischoff," a sister ship of the "Lancing," has also just been converted from a steamer to a full rigged ship on the same plans and specifications as those in which the "Lancing" was changed, and is now sailing at the lowest insurance rates.

California wine producers have formed an association to control the future output of the vineyards and maintain prices.

## The Cornwall Ore Hills—I.

BY JOHN BIRKINBINE, PHILADELPHIA.

For more than a century and a half the Cornwall ore hills in Lebanon County, Pa., have been supplying blast furnaces located at or within easy transportation of this truly remarkable deposit of magnetic iron ore. The earlier utilization of the mineral obtained was confined to iron industries which could be reached by wagon haul, among which were the following:

The *Cornwall* (charcoal) *Furnace*, immediately at the ore hills, standing today as probably the best preserved relic of our older furnaces, has a record of continuous activity greater than any other in the country—viz., from 1742 to 1887, and is now in condition for blast. It is questionable, however, if this plant will resume activity, for, although close to the ore and convenient to woodland sufficient for a charcoal supply, the size of the furnace and its equipment will restrict the output so as to augment the cost of production. Nor do the special uses for iron which could be made with charcoal warrant an increase in price sufficient to encourage putting the furnace in blast.

The *Elizabeth Furnace*, built about 1750, in Lancaster County, made famous during the time it was controlled by Baron Stiegel, was long ago dismantled after being active for a century, but the property has remained in the Coleman family about 100 years and in the will of Mrs. G. Dawson Coleman (lately deceased) her desire is expressed to have it continue in possession of the descendants of Robert Coleman.

The *Reading Furnace*, now known as "Robesonia," whose ore privilege has been and may again be the cause of much litigation, is another of the old furnace locations. Modern structures have, however, taken the place of the older and less pretentious plant to which the ore reservation was assigned. When in 1786 Peter Grubb, Jr., sold to Robert Coleman one-sixth interest in the Cornwall ore hills, reserving the right to take ore for one furnace forever, neither party to the contract could have imagined that this reservation would ever mean the right to take away 2000 tons of ore per week, for probably 100 tons was then looked upon as the limit of a single furnace's digestion in that time. But advances in metallurgy have made it possible for this one furnace at Robesonia, to which the reservation has been conveyed, to smelt 300 tons of Cornwall ore daily, for which the heirs and successors of Robert Coleman must account to the other interests in the Cornwall Hills represented by the descendants and heirs of Peter Grubb, Jr. A one-half interest in this Robesonia property is now held by the Freeman family, descended from Robert Coleman, who bought the one-sixth interest in the Cornwall ore hills with the above reservation.

The *Mount Hope Furnace*, also in operation for over a century, is another instance of the appreciated value of an ore right, but in this case the accounting was between two members of the Grubb family, the furnace carrying with it the right to an ore supply as long as it used charcoal for fuel, which one brother received and another accounted for to the joint owners of the ore hills. This furnace was active until within a few years, when at the death of one brother the property was purchased by the other brother at a price which allowed a large sum for the ore privilege, thus wiping it out.

The names "Colebrooke," "Martic," "Conewago" and "Mount Vernon" recall blast furnaces which were supplied by ore drawn from the Cornwall hill by wagons, but the small output of each plant, and the necessity of scattering the iron works so as to secure a supply of charcoal made but moderate demands upon the deposit.

### Mining Methods.

In the earlier exploitations of the ore hills individuals who owned interests in the property, or who had the right to mine ore, had the ore dug and their wagons loaded at the portions of the property which were apparently desirable, some of the older excavations bearing the names of specific furnaces. About this time there were large amounts of "nigger head" ore available. This ore lying on or near the surface, having been weathered, the sulphur and some of the other objectionable ingredients leached out, was of superior grade, both on account of the high percentage of iron and because of its comparative purity. There is still considerable of this "nigger head" scattered over unwrought surfaces, but the amount is proportionately small. Some fine specimens of lode stone were obtained and an occasional piece is still discovered.

Another practice formerly followed was to expose large faces of ore to atmospheric influences, a fair proportion of the sulphur efflorescing on the surface and being washed off by rains. The sulphur and copper in the ore mined from Cornwall produced a red short iron, and except for some special purposes, such as plate for cut nails, it was not considered desirable (its low phosphorus contents not being appreciated until Bessemer steel was produced) since these interfered with the metal being applied in general to foundry purposes.

The deposit has always been an open work, no underground mining having been necessary except for following a vein of copper a few feet in advance of regular excavations. Until late years all the mining was done above the level of the creek which separates the two prominent hills, but present exploitations in the Middle Hill are below this level, requiring hoisting appliances, and the removal of a small amount of water. The spiral railway which encircled the Big Hill twice and a half will soon be no more, because the bulk of the ore has been taken out of this portion of the deposit. A general description of the Cornwall ore hills, prepared by E. V. D'Invilliers, is found in the Transactions of the American Institute of Mining Engineers, Vol. XIII, page 873.

### Transportation.

The construction of a plank road, 6 miles in length, to Lebanon, where boats were loaded on the Union Canal, and subsequently the construction of a railroad connecting the ore hills and the canal, and later also with the Lebanon Valley branch of the Philadelphia & Reading Railroad, broadened the available market for this ore. Reading and other Schuylkill Valley points, Harrisburg, Lancaster, Columbia and other locations on the Susquehanna River were supplied with Cornwall ore, and it was also sent to Pottsville, Philadelphia, Scranton, &c. Some 20 years ago the canal was abandoned. About a decade since the transportation facilities were greatly improved, a competitive railroad being constructed paralleling the Cornwall Railroad to Lebanon, where there are five furnaces, and

other lines were completed to connect with the Reading system at Manheim, and with the Pennsylvania system at Conewago. About this time the Lake Superior ores began to invade Eastern Pennsylvania, their excellent character contributing to restrict the market for Cornwall ore to a local production of Bessemer pig iron, so that at present the furnaces using ore from the Cornwall hills cover practically the same district which was reached by wagon haul a century ago. An exception may be made to the roasted ore now being sent to Scranton by the Lackawanna Iron & Steel Company, which is probably done merely as an experiment, for testing in the company's blast furnaces at Scranton mixtures of which Cornwall ore forms a part.

At present two of the five furnaces at Cornwall dependent upon Cornwall ore must be reconstructed if they are to be operated, and the third, the old charcoal furnace, is retained more as a relic than as an industry. None of the furnaces located immediately at the ore hills have been in operation for over a year. At North Cornwall, 1 mile from the ore hills, there is one furnace which has been idle for four years. At Lebanon, 6 miles from the ore hills, there are five furnaces, all of which are now active or being relined. At Sheridan, distant 16 miles from Cornwall, there are two furnaces, both in blast. At Robesonia, 20 miles from this ore bed, one furnace is in operation, and it is this plant which controls the reservation to take from the hills the ore for one furnace.

In the past ten years a total of 6,192,852 long tons of ore have been taken from the Cornwall ore banks, the maximum annual output being 769,020 long tons. With one exception this is the largest quantity taken from an American iron ore mine in one year. The total quantity of iron ore which this property has contributed since the earliest exploration now exceeds 12,500,000 tons, therefore nearly one half of the output was mined within the last decade.

### The Ownership of the Hills.

Although Peter Grubb was at one time sole owner of what is now recognized as the Cornwall ore hills, his sons and grandsons disposed of their holdings at various times until Robert Coleman possessed five-sixths and the heirs of Peter Grubb one-sixth interest. These relative proportions were maintained by descendants of Grubb and Coleman until 1894, when the first transfer of an interest in the property for over 100 years otherwise than by descent was made by the purchase on the part of the Lackawanna Iron & Steel Company from the assignees of the holdings of Robert H. Coleman. The division into sixths was naturally followed by partitions among members of families, and when the Cornwall Ore Banks Company were formed the interests were divided into 96 parts, of which one branch of the Coleman family held 50 parts, another branch of the same family 30 parts, and the Grubb family 16 parts. Subsequently further divisions and transfers were made and at present writing the interest in the Cornwall ore hills may be summarized as follows:

	Shares.
Estate of G. Dawson Coleman (deceased) .....	15
Seven living heirs are represented by these undivided shares.	
Estate of Robert Coleman (deceased) ..	15

Now in litigation, for which there are four claimants—two in France and two in the United States.	
Mrs. Rogers (R. H. Coleman, trustee). 15%	Lackawanna Iron & Steel Company.. 15%
Formerly interest of R. H. Coleman.	
Mrs. Alden..... 6½	
Freeman estate (four heirs)..... 12½	
Grubb family ..... 16	
This is divided among six heirs.	
Total..... 96	

It will thus be seen that subsequent partitions may make troublesome fractions. Already two members of one family each own one and nine-sixteenths shares, four members of one branch of the Grubb family each have two shares and two of another branch represent, respectively, three and one half and four and one-half shares (if they may be so called). However, if the entire property be estimated at the price paid by the Lackawanna Iron & Steel Company —viz., \$135,000 per share—its total value of \$12,960,000 could be divided into small fractions, each of which would represent a liberal sum of money.

As at present divided a combination of representatives of at least four share holders is necessary to control the policy of the ore banks company, which is not a corporation, or, in fact, a formal partnership, but rather a tacit agreement or an association of owners, without any specific limitation of time (but which has existed for about 30 years), by which the ore banks are operated for the general benefit of the owners under one management. By this arrangement all of the ore is mined except that which is taken to supply the Robesonia Furnace, the various proprietors sharing in the profits of exploiting the deposit in proportion to the interests which each represents.

#### The Robesonia Ore Right.

In this connection it may be of interest to quote the phraseology of this reservation, under which the Robesonia Furnace is now, and under which it is claimed that this or some other blast furnace to which the reservation may be assigned can be operated as long as ore is won from the Cornwall ore hills. In the articles of agreement between Peter Grubb, Jr., and Robert Coleman, dated September 26, 1785, for the sale of one-half of Peter Grubb, Jr.'s., interest in the Cornwall Furnace and other lands he reserved for himself, "his heirs and assigns the liberty of digging, raising and hauling away a sufficient quantity of iron ore to supply the furnace which he purchased of John Patton, or any other furnace he may erect elsewhere, provided there is not more than one furnace blowing at the same time." To carry out this agreement, on May 9, 1786, this grandson of the original Peter Grubb, developer of the ore hills, sold to Robert Coleman for the sum of \$8500 gold or silver, one-sixth interest in Cornwall Furnace, Hopewell Forges, mineral and other lands, including the Cornwall ore hills, "saving and excepting unto the said Peter Grubb, the grantor, his heirs and assigns forever the right, liberty and privilege at all times hereafter of entering upon the premises hereby granted and released, with his and their horses, carts, carriages and servants, and of digging, raising and hauling away a sufficient quantity of iron ore for the supply of any one furnace, at the election of Peter Grubb, his heirs or assigns, at all times hereafter, anything hereinbefore contained to the contrary in anywise notwithstanding," and at the end, the deed of conveyance again mentions the reservation of this right, thus: "saving and excepting always thereout, the right, liberty and

privilege hereinbefore reserved unto the said Peter Grubb, his heirs and assigns, of a sufficiency of iron ore for the use of one furnace forever."

It is not surprising that legal proceedings should have been instituted to determine the scope of the reservation and the influence, if any, which the changes due to advances in metallurgical science would exert; for the one-sixth interest Robert Coleman purchased of Peter Grubb, Jr., with the reservation being undivided, was incorporated with the two-thirds interest which he also purchased, and the entire holdings of the Coleman heirs (five-sixths of the Cornwall ore hills) have been and are now held responsible for the ore removed under this grant. In other words, there are three distinct parties specially interested in this ore reservation—viz.: 1, The stockholders of the Robesonia Iron Company, which has succeeded Peter Grubb, Jr., as grantee; 2, the heirs of Robert Coleman, the grantor, who now own the five-sixths interest in the ore hills, and, 3, the members of the Grubb family, who own one-sixth interest in the ore hills, which holding is not a party to the reservation. Therefore the ore taken from Cornwall by the Robesonia Iron Company is chargeable to the five-sixths interest held by the Coleman heirs and by the Lackawanna Iron & Steel Company in proportion to their holdings, and not to the one-sixth interest now owned by the Grubb heirs. The result of the litigation over this reservation may be summed up at the present time as indicating that the grantee has the right to take advantage of all improvements, and is not restricted as to the quantity of ore to be taken, except that the amount must not exceed the requirements of one blast furnace; but the grantee cannot maintain two furnaces, so that one goes into blast on Cornwall ore immediately at the close of a campaign by the other using the same material, but the furnace must be subject to the ordinary lost time due to repairs, relining, &c.

The grantee has the right to enter the ore property and remove the ore in its own way, and it can select, and has selected specially advantageous ground for mining operations, but must confine its workings so as not to unnecessarily interfere with and jeopardize those of the owners. The grantee has the right to take "a sufficiency of iron ore for the use of one furnace forever," and may elect, should it not desire to smelt it in the furnace owned or controlled, to assign or transfer said reservation to some other furnace. At the time that the blast furnace, farm and woodlands, houses, &c., which make up the Robesonia Iron Company's property changed hands, it was estimated that the ore reservation entered into the purchase price for about \$500,000. If this figure is correct the value of the ore right would, at present rate of consumption, represent a cost of 30 cents per ton of ore, if interest on the above estimated value of the reservation is calculated at the rate of 6 per cent. per annum. The mining operations for the Robesonia furnace are carried on independently, but without interference with those of the Cornwall Ore Banks Company, the owners of the furnace having elected to mine the "ore to supply one furnace," provided for in the reservation of Peter Grubb, Jr., for the Berkshire Furnace, which was subsequently assigned to the old Reading Furnace, the archetype of the Robesonia plant. About one-fifth of the present output of the ore hills is now mined under this reservation.

#### A New Bridge at Pittsburgh.

During last week bids were asked for by the Director of Public Works at Pittsburgh for the erection of a bridge over the Monongahela River, connecting Pittsburgh with the South Side. The bridge will be known as the Soho Bridge, and will extend from Forbes street, at Brady street, Soho, Pittsburgh, to Wharton street, at South Twenty-second street, South Side, Pittsburgh. The contract for the erection of the structure will be let in about three weeks and the specifications require it to be completed within one year from November 1, 1894. The bridge is expected to cost about \$400,000, which is said to be one-third less than it would have cost a few years ago. The Soho bridge will be of steel and not like any other structure in Pittsburgh in appearance. Its extreme length will be 2480 feet, which is longer than any other bridge in that city. The bridge proper will consist of two side arms, each 260 feet long, and a central double rib stiff arch 520 feet long. The south approach will be 278 feet long. The north approach will be a steel viaduct 815 feet long to Forbes street. There will be two sidewalks 11 feet 3 inches wide on the approaches and 7½ feet wide on the main span. The driveway will have two tracks, one on each side, with an 18-foot space between for vehicles. At each entrance to the main span an ornamental portal 70 feet high will be placed. The bridge floor will clear the river, at full pool, by 54 feet. On the north side it will clear the Baltimore & Ohio Railroad tracks by 27 feet and Second avenue by 35 feet. Stairs will lead from the bridge at Tustin street and Second avenue. Three stone piers will support the bridge. The approaches will rest on structural steel piers. Spans over the streets will be ornamented. It is expected that the company getting the contract will have all material prepared during the winter, so that when the spring opens there will be no delay in construction. Copies of the specification and blue prints have been mailed to all the prominent bridge building firms in the country.

The plant of the Crescent Sheet & Tin Plate Company, Cleveland, Ohio, will, it is announced, be in full operation by April 1, 1895. The land on which the mill will be established is a tract of 6½ acres on Bessemer street, Cleveland, which the company have purchased at a cost of \$14,500. Contracts have been placed for hot and cold mill machinery and for four Corliss engines. The buildings and equipment will cost about \$150,000. The production of the works will be black and terne plates exclusively. The buildings, for which the contracts were let this week, will be of iron and brick. The works will give employment to about 250 men. The temporary offices of the Crescent Sheet & Tin Plate Company are at 312 Perry-Payne Building, Cleveland. The officers of the concern are: President, H. P. Macintosh; vice-president, B. F. Arthur; secretary and treasurer, J. A. Matthews; and superintendent, James Paton.

The Leadington Lead Company, Leadington, Mo., have closed down their large mines at that place, throwing a large number of men out of employment. They claim that the present low price of lead does not justify them in working the mines.

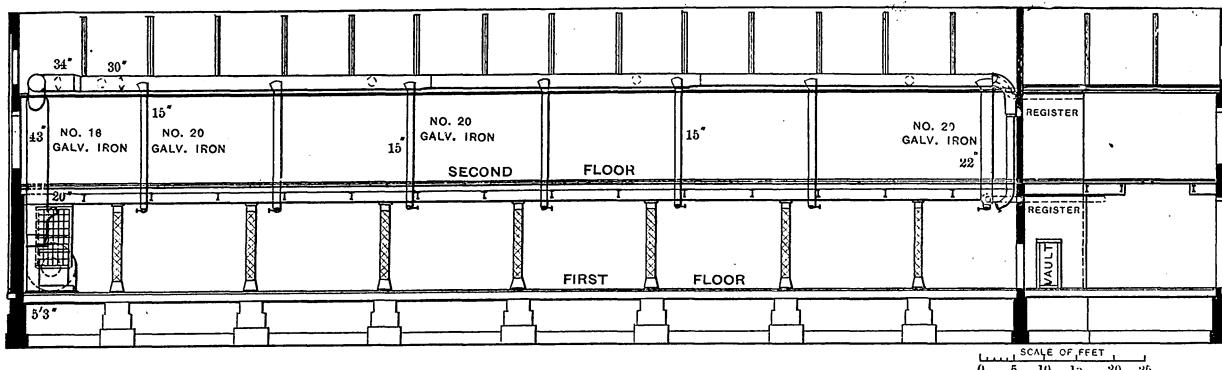
### Norton Brothers' New Factory.

Norton Bros. of Maywood, Ill., dedicated their new tin can factory on the evening of the 1st inst. This factory has been built to take the place of the one on River street, Chicago, which was burned on February 19. It will be used for the manufacture of all kinds of tin packages, plain and decorated, and of any size or shape. The building is a brick structure, two stories high and 250 feet square, erected almost without regard to expense so as to embody the most perfect labor saving devices and at the same time provide the workmen with the highest comforts and conveniences. It is pronounced one of the finest factories now in existence by

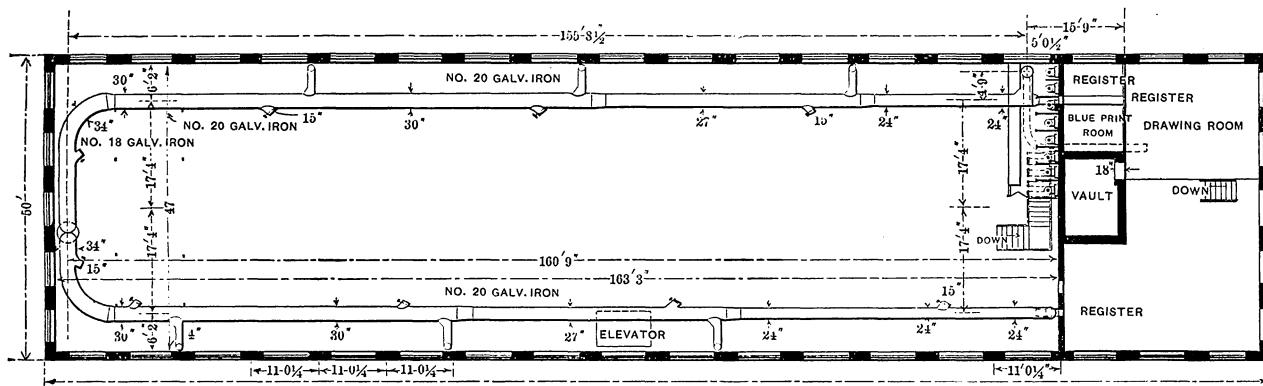
the kindly feelings of the employees toward their employers, Mr. Fox at the conclusion of his remarks presented a testimonial of esteem signed by the employees and engrossed on parchment in the works. Dancing followed, after which generous collation was served. The chronology of this company is as follows: 1868, business established in Toledo, Ohio, as E. Norton; 1870, firm changed to Norton & Fancher; 1871, removed to Chicago, office and factory at 63 and 65 South Canal street; 1873, opened office at 10 State street, firm changed to Norton Brothers; 1874, removed office and factory to 44 and 46 River street; 1885, opened factory at Maywood; 1890, incorporated under style of Norton Brothers, commenced manufacture of

### A Novel Hot Blast Heating Plant.

The machine shop of the Fuel Gas & Mfg. Company of Brinton, Pa., has been provided with a hot blast heating system embodying several novel and interesting features, particularly in the arrangement of the hot air piping. The designs for this system were made by Julian Kennedy of Pittsburgh and the Buffalo Forge Company of Buffalo, N. Y., built and guaranteed the plant. Fig. 1 is a longitudinal sectional elevation of the building, Fig. 2 a plan view and Fig. 3 a transverse section. The hot blast apparatus is shown at the extreme left in Fig. 1. The building is 50 feet wide by 200 feet 2½ inches long, the machine shop proper being



*Fig. 1.—Longitudinal Sectional Elevation.*



*Fig. 2.—Plan.*

### A NOVEL HOT BLAST HEATING PLANT.

those competent to express an expert opinion. The dedication of the building was made a gala occasion for the employees and residents of the vicinity. A short programme of exercises was prepared, as follows: Tender of the building by the architect, F. R. Schock; acceptance by the president, O. W. Norton; "Maywood of the Past," Garrison P. Nichols; "Maywood of the Present," Gen. Wm. Sooy-Smith; "Maywood of the Future," H. F. Frink; "Retrospective and Prospective," Edwin Norton; "Our Health, Our Wealth and Our Happiness," Samuel Fox, an employee. In his address Edwin Norton referred to the fact that in the quarter of a century of the firm's existence as manufacturers they had never had a strike. He also stated that in the months of July, August and September the tin plate factory connected with this plant had turned out over 9,000,000 pounds of the finest quality of tin plate. As an evidence of

tin plate; 1892, built present tin house and sash weight foundry; 1894, River street factory destroyed by fire February 19, opened offices in Masonic Temple, February 20; opened warehouse, corner Sixteenth and Johnson streets, April 1; opened new factory at Maywood, November 1. The directors of the company are Oliver W. Norton, Edwin Norton, Henry M. Norton, Horatio N. Norton, Lawrence A. Norton, Henry F. Akin and W. L. Gifford. The officers are as follows: Oliver W. Norton, president; Edwin Norton, vice-president; W. L. Gifford, secretary, and O. P. Swift, treasurer.

The Neafie & Levy Ship Building Company of Philadelphia have just turned out from their yards a handsome twin screw steamer for the Cuban trade, named the "Purisima Concepcion." The vessel is 242 feet over all, 40 feet beam, and 12 feet depth of hold. She is built for passengers and freight.

155 feet 8 1/2 inches long, the offices occupying the remaining portion. The drawings show the arrangement of the piping and also give the thickness and diameter of the several sections.

The heating apparatus consists of a 100-inch Buffalo fan and a 4000 foot capacity heater, the fan being driven by a 6 1/2 x 8 inch direct attached upright engine. The wheel inside the fan casting is 71 inches in diameter by 38 1/4 inches wide. At 340 revolutions per minute the fan will displace 48,360 cubic feet of air.

The entire hot air piping is carried clear up to the roof trusses and thence is brought down, with outlets on second story, into the first story. This is an unusual application, and the piping would have been distributed equally on each floor but for the presence of so much machinery and shafting. As indicated in Figs. 1 and 3, the uptake from the heater is 48 inches in diameter. At the top this branches to each side,

along which extends, on the roof trusses, a galvanized iron pipe, which is 30 inches in diameter where it joins the branch, and 24 inches in diameter at the other end. In these two lines of pipe are openings for heating the second story, and from them descend pipes for heating the first story, as shown in Figs. 2 and 3.

The temperature guaranteed on this plant was  $65^{\circ}$ , from zero outside, the calculation being to use exhaust steam from the main engine in the day time and the exhaust steam from the fan engine at night, together with live steam when necessary. Except during the coldest weather the exhaust steam from the fan engine is sufficient to heat the building above the freezing point at night. Outside of the repairs,

resume work on eight hours' time, six days each week. For the past 13 months the shipyards, machine and car repairing shops only worked five days each week, while the trainmen worked only half time.

#### The Practical Working of the "Chicago's" Machinery and Boilers.

Among the first vessels proposed for the new navy were the "Dolphin," "Atlanta," "Boston" and "Chicago," the latter being by far the largest of the four. The "Chicago" has been over five years in commission, and as her boilers have lately been extensively repaired at Antwerp and her machinery thoroughly overhauled, it seems a proper time to show just what has been the experience of those who have been in her engine and fire rooms and watched the working of the engines and the behavior of the boilers during that time.

#### Machinery.

At the time the "Chicago's" machinery was proposed the only solution of the problem as to how her pistons were to have the proper length of stroke seemed to lie in giving her beam engines. Triple expansion was in its infancy at the time, and so compound engines were agreed upon. The steamer "Louisiana" was then running between New York and New Orleans and she had beaten the record. As her engines were beam engines it was thought that that type would answer very well for the war ship, and after many differences and much discussion that type was agreed upon. We are all accustomed to see our paddle wheel steamers with their walking beams working in a fore-and-aft direction, away up above the uppermost deck, but those in the "Chicago" are down under the steel protective deck, and instead of working fore-and-aft they are placed athwartships, two for each propeller shaft. Steel had not made as much progress in those days as it has since, and, consequently, the weights of the various parts of the "Chicago's" machinery are well in excess of what they would be were they built to day. The surface condenser is very heavy, for example, as it is made of cast iron, and the beams are built up of cast and wrought iron. With this peculiar kind of machinery there are too many bearings and there is great difficulty in keeping the various parts in adjustment and alignment. When making 45 revolutions per minute with the main engine, the average speed under ordinary conditions of weather is 10.7 knots, the average power developed being 1231 horse-power which includes all the auxiliaries. At this speed, which is the average sea rate of the ship when cruising, 60 gallons of lubricating and 10 gallons of cylinder oil are required for the day's consumption. This gives 0.049 gallon of lubricating oil per day for each horse-power.

#### The Condensers.

The beam centers are on top of the condensers, and as they are very heavy and the power is transmitted through them it necessitates the condensers being, as above stated, extremely bulky. These surface condensers have always been satisfactory as far as the vacuum was concerned, 26 to 27 inches being readily maintained. This, of course, is largely due to the excellent working of the air pump, which is an independent air and circulating pump of the Blake pattern.

In addition to the main condenser

there is an auxiliary condenser in each engine room which receives and condenses steam from all the auxiliary machinery. This idea was somewhat of an experiment on board the "Chicago," although to-day it might be somewhat difficult to recognize it as an experiment, and its workings are considered as being eminently successful. These auxiliary condensers have combined air and circulating pumps which are very good, barring one objectionable feature, and that is the packing boxes are too shallow, making it necessary to squeeze the life out of the packing before getting it properly tight, and so using up the packing much too quickly. These condensers are not both in use at once, but are running alternately, month and month about. Their tubes have been once renewed after being in use four years, owing to their being so badly worn as to be very brittle. When the tubes were broken, after removal, the fracture showed but very slight, if any, metallic appearance, but they were more like clay in substance. The object of these various condensers is to save fresh water for the boilers, in which particular they are considered as being very successful. To each main and each auxiliary condenser is fitted a "bleeder valve" which allows steam pressures in excess of those for which the safety valves are set to be reduced without raising the valves and at the same time avoids the nuisance of blowing off and saves fresh water.

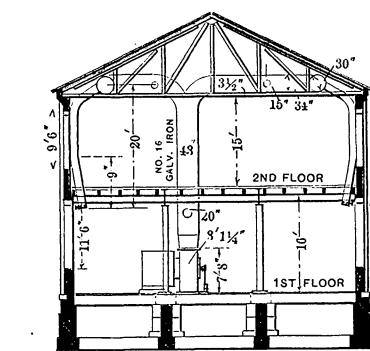
#### The Distilling Apparatus.

In speaking of condensers it is as well to say a few words regarding the fresh water distilling apparatus. The distillers, two in number, are supplied with steam from the evaporators located in the compartment just abaft the berth deck and inside the forward bulkhead of the forward fire room. One object in placing the evaporators in their present location is to allow the pure fresh water to run by gravity to the tanks that are down in the hold. A very satisfactory rate of distilling is about 4000 gallons per day of pure water, at a temperature not too high for almost immediate consumption.

Once a month the coils from the evaporators are removed for scaling. In this time there is usually about  $\frac{1}{8}$  inch of lime scale deposited. The coils in the distillers are removed once a year. Scale is known to be a very bad conductor of heat, so that in cleaning the walls of the evaporators their shells are never scaled, the deposit frequently being  $\frac{1}{2}$  inch in thickness. The plan has prevented the passage of heat into the compartment, which, in spite of every precaution, is often too high for living purposes.

Steam from the main boilers, passing through closed coils in the evaporators, gives up its heat and evaporates the sea water surrounding them. Physics teaches us that, in distilling water, we are rid of all impurities—that is, nothing but pure water passes over as vapor. Experience has, however, demonstrated that certain volatile matter is also carried over, a fact apparent to any one who has tasted recently distilled water and objected to the oily taste. In spite of all care and precaution there are still times when it seems almost impossible to get rid of the fishy taste, especially in localities where jelly fish are found in large numbers, or where fish go to spawn.

Where the condenser tubes,  $\frac{5}{8}$  inch in diameter, pass through the tube sheet they are packed into a ferrule of *papier maché*,  $\frac{1}{2}$  inch outside diameter. The



A Novel Hot Blast Heating Plant.—Fig. 3.—Transverse Section.

there is practically no cost, with the exception of the live steam used for running the fan engine, which is a very small matter. Part of the air is taken from the factory and part from outside, most of the air being used over and over again as a matter of economy. There being comparatively few people in the building, per cubic foot of space, the air is not vitiated to a great extent by respiration. In a factory using more power it would be possible to do the heating in the severest weather with exhaust steam alone and taking all the air from outside the building.

The condensation in one of these heaters is from three to five times as great as in the same amount of direct heating, either running around the building in the form of 1-inch pipe, or per square foot of direct radiation. Of course, by drawing the air by the action of the fan direct from the outside and passing nothing but cold air over the coils a greater amount of steam is condensed than when taking the air from the inside. If there is no other use for the exhaust steam, however, then the amount condensed does not enter for consideration to any great extent.

We may add that under favorable conditions the larger part of the piping employed in the building just described could have been dispensed with. In many plants of this character, the apparatus would be placed near the offices, and a stand pipe would be run through the center of the building to the different floors, and this, with the office connections, would complete the layout. The cost of installing a plant of this character, exclusive of the galvanized iron work, is in the neighborhood of \$1250.

The Pennsylvania Railroad Company have issued orders on the Camden and Amboy Division for all departments to

end of the tube is slotted and drifted out to prevent the packing from coming out of the tubes and to prevent creeping. This method has been found to answer every requirement, besides being more economical than the use of screw glands or followers.

The present way of installing the independent air and circulating pumps is slightly disadvantageous, owing to the inconvenience of getting at the valves of the air pumps, the space being very cramped. This defect has been remedied in vessels of later construction. The advantages, however, of this independent pumping system far outweigh all other considerations, and are to be found in the fact of its being possible to maintain an excellent vacuum of from 26 to 27 inches, even in tropical waters. In former days a satisfactory vacuum to start off with was only obtainable under great difficulty, whereas now one half hour before the engines are needed one has but to start the independent auxiliary pumps and the engine is always ready to start upon the signal from the bridge. The custom on board the "Chicago" has been to start these pumps an hour before the main engines are to be used, and to keep them running from six to ten

faces to be oiled and adjusted between piston and crank shaft, which is three, if not four, times as many as are ordinarily found in other types of machinery. In spite of the fact of many of these bearings oscillating through comparatively small arcs, they manage to heat with unexpected rapidity and consequently require great care and attention. As has been remarked above, the use of cast iron instead of steel makes the weight excessive and is consequently a great disadvantage, as the matter of weights is so all important a consideration. To these disadvantages may be added that of the slow rotative speed of the machinery.

quite up to date, and so fall short of the requirements of a modern cruiser. Still as they are believed to be somewhat unique a result of experience with them is a matter of curiosity as well as of interest.

The boilers, Fig. 1, are cylindrical, and were designed for a working pressure of 90 pounds per square inch above the atmosphere, with a total grate surface of 672 square feet and a total heating surface of 19,950 square feet, furnishing steam for about 5000 horsepower with forced draft on the closed fire room system. The total power is divided among seven boilers, five of which, A, B, C, E and F, are double

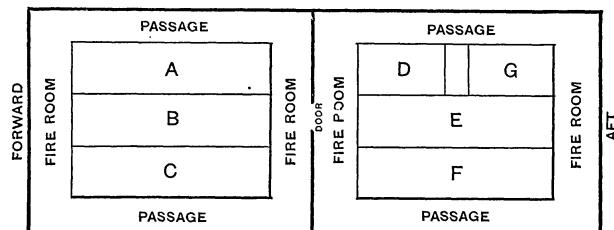


Fig. 1.—Diagram Showing Arrangement of Boilers.

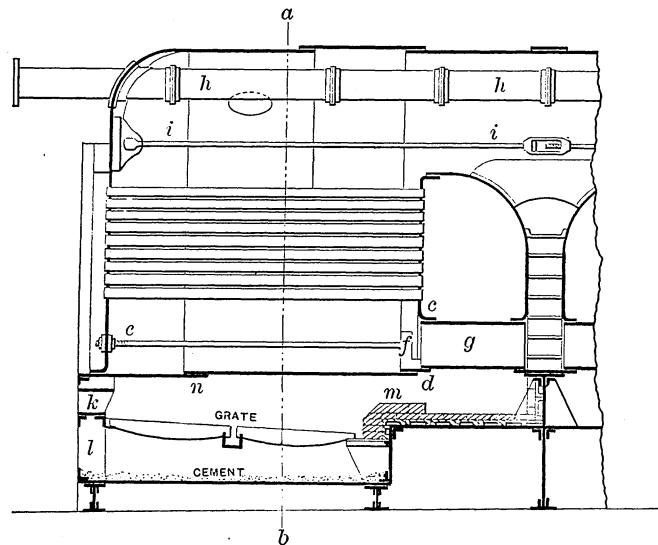


Fig. 2.—Vertical Longitudinal Section of Boiler.

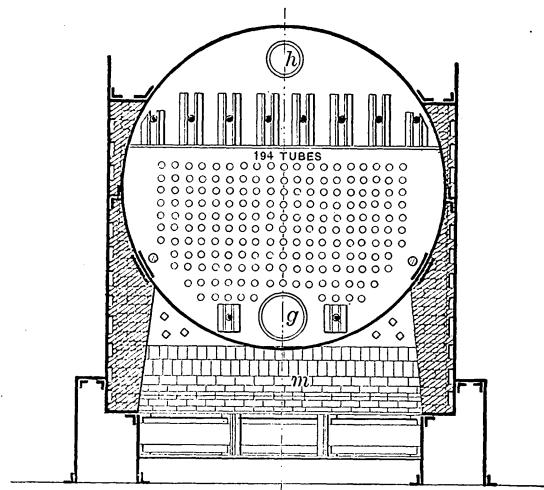


Fig. 3.—Cross Section on Line a b of Fig. 2.

*c d*, flange of back tube sheet connecting water tube or flue *g*; *e f*, lower braces; *h*, dry pipe; *j*, main braces; *k*, furnace mouth; *l*, ash pan opening; *m*, bridge wall; *n*, girth seam.

#### PRACTICAL WORKING OF THE "CHICAGO'S" MACHINERY AND BOILERS.

hours after the engines are stopped. This latter custom has been adopted in order to handle any surplus steam that may be generated, but more especially to prevent the drying up and leaking of the paper packing of condenser tubes, which would admit salt water to the fresh water side. The two air pumps and the circulating pumps are worked by one steam piston, and with them no trouble has been experienced on board the "Chicago."

#### Beam Engines for Screw Propulsion.

The result of experience with beam engines for screw propulsion shows that the type has not become as popular as was anticipated by its advocates, who have been instrumental in having it placed on board various types of vessels, from the size of a tugboat to the "Chicago." As installed on board that cruiser, there are 18 working sur-

While but little real trouble has of late years been experienced with the machinery, it has by no means impressed itself favorably upon the minds of those who have had the handling of it, but it is admitted that it has some few advantages, and among them is the placing of the cylinders low down in the ship, and the fact of their being vertical reduces largely the wear from friction. The Stephenson double bar link has also brought forth favorable comment, as it has proved to be more easily adjusted for wear than the ordinary slotted link.

#### Boilers.

The boilers of the "Chicago" were also very much of an experiment, and while they have a number of excellent features, which will be mentioned later on, the fact of their not having been duplicated in later vessels may be considered as proving that they are not

ended, 9 feet diameter of shell, and 24 feet 6 inches long; and the other two, D, G, single ended, of the same diameter of shell, but only 11 feet 10 inches long. The two single ended boilers are placed back to back, with a light bulkhead lined with fire brick between them, the two together occupying the same length of floor space as one of the double ended boilers. The boilers are grouped in two large water tight compartments below the protective deck, with their longitudinal axis in the fore-and-aft direction, which arrangement gives four athwartship fire rooms.

The peculiarity of these boilers is the introduction of the brick setting on very much the same principle that one sees with boilers in ordinary use on shore. About 6000 bricks are required for each boiler of the double pattern. At the time these boilers were built 72 inches was about the widest steel boiler plate rolled, and to carry out the de-

sign it was found necessary to put a transverse seam about 30 inches from the furnace doors. This gave a double thickness of metal in a hot part of the furnace, and also one subject to great changes of temperature, owing to the cold blast striking it whenever the furnace doors were open.

It must be clearly understood that that portion of boilers usually known as the crown sheet is in this type represented by the lower portion of the cylinder against which the heat impinges. The greater portion of the trouble given by these boilers is due to these transverse seams, which, owing to frequent expansion and contraction, have been the cause of serious leaks both in the seam and in the rivet holes. The bottoms of these boilers have buckled down at various times and the location of this trouble has almost invariably been close to these seams.

The accompanying drawings, Figs. 2 and 3, show longitudinal and cross sections of one of these double ended boilers, from which it may be seen that the furnace is entirely external to the shell of the boiler, and will explain what has just been said regarding that part of the boiler usually called the crown sheet. The girth seam is also shown, and in regard to this it is probably quite well understood that the improvements in the foundry now admit of plates being rolled of such size that a girth seam is no longer a necessity.

When undergoing repairs recently at Antwerp, Belgium, it was found that these bottoms had become so dangerously weak that it was no longer safe to use them and it was found necessary to put new bottoms in both ends of the three main boilers and one of the single boilers. In order to do this work as economically as possible it was not deemed advisable to cut away the hatches or any of the beams or deck planking, so that the plates had to be hoisted and lowered through the hatches. So, though larger plates might have been obtained, those actually used were in two pieces for each boiler, but with this all important difference, the longitudinal seam was in this case at the lowest line protected by the brick partition wall. This change was made to prevent the exposure of the seam to the direct heat of the fires. The half boiler has been about four months in use and has thus far developed no weakness, whereas the boilers, as originally fitted, gave more or less trouble from the time the ship first started on her cruising from the New York Navy Yard.

In these days when everything seems to be more or less sacrificed for the extra fraction of a knot to be made on the trial trip boiler tubes have, like many other features, been made and fitted in a way that seems to result in greater trouble and vexation than appears at all necessary. Aboard the "Chicago," however, they have given a minimum amount of trouble. There have been fewer leaks at the ends exposed to the fire and less bother with the tube sheets than has been the case with other vessels that have served in the same squadron. In a long trip at sea where several of the vessels found it necessary to clean tubes almost daily, once a week was sufficient for the "Chicago's" tubes. The tubes are made of steel and are 3 inches in diameter. It can readily be understood that there is far less liability to choke up with tubes of this size than with those of smaller diameter that are in use in vessels of later construction.

The steam drum, for use when not in

action and in ordinary cruising, is inclosed in the smoke pipe and at about the level of the gun deck. In action this drum is not used, steam being taken directly from the boilers through another set of stop valves, all of which are below the protective deck. The steam drum gives dry steam for the main engines and has effectually insured there being no water carried over to the cylinders.

#### Brick Setting.

Originally the furnaces were 7 feet long by 8 feet wide, and were fired through two furnace doors. By this arrangement, however, the fires were checked to a certain extent in the entire furnace whenever either door was opened. To obviate this objectionable feature a central partition wall of fire brick, extending from the ash pit to the boiler bottom, was constructed in each furnace, dividing it into two independent furnaces each having but one door. It is this partition wall that protects the longitudinal seam in the repaired boilers already referred to.

Regarding the bearing that the heating of these bricks has upon the boilers there has been considerable discussion, and the decision as to whether this feature is a success or not may well be considered as the most vital point regarding them. While opinions may differ more or less as to the advantage of this type of boiler, as a whole, those who have seen the practical working of it seem to be quite agreed in relation to this division of the furnaces that while the bricks have cut off a portion of the heating and grate surface, and have thereby proved disadvantageous, this has been more than counterbalanced by having smaller furnaces capable of being more carefully regulated. When these boilers were in process of construction they were very severely criticized by foreign engineering periodicals, but the experience of over five years has proved a number of these adverse criticisms to be almost entirely groundless. The reputation of the "Chicago" as offering a steady gun platform when at sea is excellent, but upon one or two occasions she has had her share of bad weather and heavy seas, in which she has rolled and pitched about considerably. During this bad weather not a brick was displaced, nor were there any signs of cracks in the masonry. The high temperature obtained in a brick furnace fuses the ends of the bricks and the cement into one entire surface, so that whenever it becomes necessary to remove any of the fire bricks they have to be dug out in pieces. This high temperature means so much more rapid rate of conduction of heat.

By far the greatest advantage in having this high temperature is the more complete combustion of the fuel.

Another advantage possessed by the brick furnace lies in the fact that the large number of bricks form a reservoir of heat, which is given off at the time of firing, or working the fires, and allows a constant steam pressure to be maintained. Upon one of her trips the ship ran for ten days at 42 revolutions per minute and did not vary one-tenth of a revolution per minute during the entire run.

The regularity of her speed was commented upon during the recent naval review, and, so steady was the pace, the "Chicago" was selected as the ship upon which all others were to regulate the revolutions of their engines. When she was in the lead the distances and bearings between the other vessels of the squadron were noticeably more reg-

ular than when any of the other flag ships took the head of the column.

The care and attention bestowed by the officers on duty in her engine rooms upon the working of her machinery and the firing of her boilers, and the cleverness and alacrity they displayed in carrying out all orders in relation to handling the engines, are not at all reflected upon by these remarks, for what they did has been recognized and favorably commented upon by those highest in authority. Fresh water is always used with the boilers and at least six hours are allowed for getting up steam. Another precaution is that the fires are never hauled, but are allowed to gradually die out in the furnaces, thereby preventing largely that unequal expansion and contraction that have frequently proved so very disastrous.

Through the back connection of the double ended boilers are water flues, *g* in the drawing, some 14 inches or so in diameter, to allow a proper circulation of water between the ends of the boilers. With these flues there has been more or less trouble. The stress is intensified owing to the boiler shell being cut away to allow the entrance of the heated gases to the back connection. The furnace at each end has its independent combustion chamber, which extends across the entire width of the boiler, the side walls being a continuation of the side walls of the furnace and are lined with fire brick. A water leg is formed between the two combustion chambers, the bottom of it being horizontal and the width the same as that of the boiler, the sides being vertical and striking in tangent to the shell at the ends of the horizontal diameter. Above the water tubes is one row of braces  $2\frac{1}{8}$  inches diameter, and two braces 2 inches diameter are fitted between the front and back tube sheets at each end of the boiler.

It has been found necessary upon two or three occasions to replace the water flues *g* because the steel became crystallized and cracked. It has also been found that the longitudinal braces *e f*, between the tube sheets and below the tubes, bend upward. The tube sheet below the lower row of tubes bends toward the front of the boiler, which irregularities have great bearing upon the troubles in connection with the water flue. The fact that the bottom of the boiler, that part already referred to as taking the place of the ordinary crown sheet, sags may possibly be considered as the cause of trouble with the water flues.

The longitudinal braces below the tubes were placed there to prevent the tube sheets from being separated, and when pressure was in the boilers these braces were to be under tension, but experience has shown by their bending so constantly that they are under compression and act as struts to prevent the tube sheets from coming together.

As another proof of the high temperature in connection with these boilers, it may be mentioned that the furnace doorways, when originally fitted, had steel arches about  $\frac{1}{8}$  inch in thickness, to support the furnace lining at the front. These arches burned out so rapidly that it finally became necessary to make them entirely of fire brick, which change has resulted in far less trouble and in being in every way more satisfactory.

Congress has appropriated a portion of the sum necessary to construct new machinery and boilers for the "Chicago," which can be taken as a safe indication that what she now has will soon be replaced by more modern types

which, while they will drive her over 18 knots per hour, will also effect a saving of between 200 and 300 tons in weight. Triple expansion engines and coil boilers would probably result in 8000 horse-power and would also give her additional space below, a feature that would be heartily appreciated by various other departments than that of steam engineering.

### Electricity in Wire Mills.

Thomas Richardson, president of the Northeast Coast Institute of Engineers and Shipbuilders, delivered an address mainly devoted to the subject of "Electricity as a Power Transmitter." In the course of his address he said that an example of what may be termed ideal electrical driving is that of the Bedson Wire Company of Middlesborough, where the installation is the most perfect and complete that has as yet been attempted in England. Every process connected with the manufacture of wire is carried out by means of electricity, the wire drawing, galvanizing, spinning and barb fencing machines, overhead and locomotive cranes, hydraulic pumps, induced draft fans, lathes, centrifugal pump are all independently driven by electric motors. Owing to the entire absence of shafting and beltting the construction of the building is very light, and the convenience of the whole plant is most noticeable. The current is generated by a 600 horse-power dynamo, driven direct by a three-crank triple condensing engine with boiler of 160 pounds pressure. A special tunnel, 350 yards in length, has been constructed for the conveyance of the conductors, and branches are taken from these to 50 motors, which vary from 5 to 40 horse-power each. The lighting of the works is most complete, the greater part being carried out on the inverted arc principle, which is so perfect that there is an entire absence of shadows. The original plans for driving these works electrically were prepared by Selby Bigge. Before definitely deciding to put down such a novel plant several experiments were necessary, for which purpose special machines were designed by Mr. Bedson, the managing director of the Bedson Wire Company. These experiments were made at Liège by H. Pieper, and were so successful that after an exhaustive series of tests the directors of the company decided to adopt the electrical installation in its entirety.

A novel feature in connection with the boilers at the Bedson works is the application of Ellis and Eaves' system of induced draft. This is the second application of the system to land boilers, the first having been made at the Atlas Works, Sheffield, originally arranged with Lancashire boilers. These have gradually been replaced by ten single ended boilers of the marine type, the advantages claimed being as follows: 1. Considerable economy compared with the Lancashire boilers with Galloway tubes. 2. Considerable reduction in space occupied. 3. Absence of smoke. 4. Greater elasticity of power. In ordinary work, by maintaining a vacuum of 3 inches at the fan, the combustion is at the rate of about 35 pounds per square foot of grate surface, and one single ended boiler can readily evaporate as much steam as three Lancashire boilers 27 x 7 feet, with ordinary chimney draft. Where the demand for steam varies in a works, the system is a great con-

venience, and this is especially the case for electric light installations. It is evident that with this system of draft, or with any other efficient system, the assumed consumption of 13 tons per day could be still further reduced.

### THE WEEK.

The *Monde Economique*, after careful investigation, estimates the world's coffee production for the current year at 12,000,000 bags. As against this output, larger than that of any previous year, there is a consumption of only 10,500,000 bags.

It is calculated that the operators of the Schuylkill Valley, Pa., coal region will put out at least 1,250,000 tons of anthracite coal during the month of November. Of this amount, about 1,000,000 tons will be marketed by the Philadelphia & Reading Coal & Iron Company.

The coinage executed at United States mints during the month of October aggregated 4,044,360 pieces, of the value of \$4,152,700; of which 264,360 pieces were gold, of the value of \$2,911,800; 2,150,000 silver pieces, of the value of \$1,217,000; and 1,630,000 pieces of minor coin, of the value of \$23,000. Of the silver coined, \$600,000 were standard silver dollars.

Ignatius Donnelly figures out from the last census returns that in 1890, 9 per cent. of the population of the United States owned 71 per cent. of all its wealth. One fifth of 1 per cent. of the people of this country owned \$12,000,000 of property, or about one-fifth of the whole property of the nation.

A new industry has been started in the San Joaquin Valley of California by Chicago tanners—namely, the cultivation of canagre, a weed of the dock species containing a large amount of tannic acid. A large tract of land has been purchased on which the weed will be planted, and extensive works for preparing the acid will be built, at a cost of \$300,000. It is said that with the acid from this plant leather can be tanned better than by any other means.

Russell Sage is credited with the statement that the Manhattan Elevated Railroad Company have caused plans to be drawn for a double decked road to be operated by electricity in New York City. The scheme is said to have been submitted to prominent engineers of the United States and Europe and pronounced feasible. "The upper structure," said Mr. Sage, "could be constructed of light steel and used for express trains. The uprights could be placed by the side of those now in use, and would not disfigure the streets. The frame work could be very light, much lighter than the present structure, because by the substitution of electricity there would be no necessity to use heavy locomotives."

The *Canadian Lumberman* calls for measures to preserve the forests of the Dominion from the unnecessary destruction and waste that is now going on in them as well as for a system of replanting in places where trees have been cut down for lumber.

The *Railroad Gazette* gives a list of accidents occurring on the railroads of the United States in September, which shows that there were 146 accidents, in which 50 persons were killed and 126 injured. Of those killed 30 were rail-

road employees, 5 were passengers and 15 trespassers. Of those injured 84 were employees, 32 passengers and 10 trespassers.

October's fire losses in the United States and Canada, as compiled by the *Journal of Commerce*, amounted to \$8,186,700—an unusually low figure, and the smallest of any one month in the past three years, excepting that of September, 1892, which was just under \$8,000,000. The loss in October, 1893, was \$11,014,700, and that in October, 1892, \$13,350,000. The losses for the first ten months of 1894 are \$25,000,000 lighter than those for the first ten months of 1893. This marked diminution is hailed with satisfaction by the fire underwriters, as promising to aid in repairing the depleted surpluses of the insurance companies, after their disastrous experiences of last year.

### The France Grease Cup.

The Henry C. Ayer & Gleason Company, Betz Building, Philadelphia, are introducing the grease cup here shown

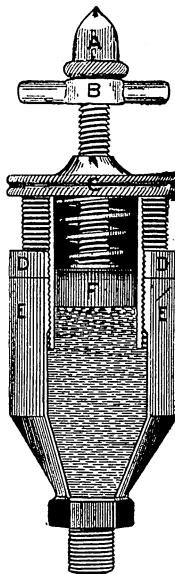


Fig. 1.—Cup in Operation.

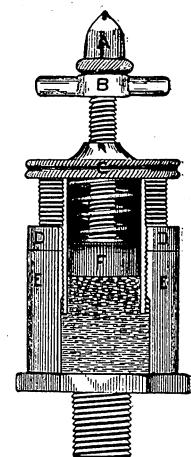


Fig. 2.—Locomotive Grease Cup.

### The France Grease Cup.

in two forms. The reservoir is formed by the cylinders E C, the latter being threaded to screw into the lower as may be required, and being held in place by the block nut D. The upper cylinder may thus be made to follow up the spring and maintain the same tension to the end of the stroke. The handle B is used to withdraw the spring for filling the cup, which may be operated entirely by hand.

It is announced that the Russian Government has decided on the establishment of two large locomotive works, one at Warsaw and one at Kharkoff, to construct the locomotives required for the Russian State railways, in order that they may be independent in this respect of Germany and Austria.

The Turkish Government has granted a concession for the opening up of a recently discovered deposit of manganese ore near Caradja, in the province of Aidin, Turkey. The deposit is said to have an area of 900 acres.

# The Iron Age

New York, Thursday, November 8, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
 CHAS. KIRCHHOFF, - - EDITOR.  
 GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
 RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
 JOHN S. KING, - - - BUSINESS MANAGER.

## Railroads Favor Foreign Tin Plate.

The manufacturers of tin plate are now traveling a thorny path. The cut in the duty on foreign tin plate was a very serious matter, involving a readjustment in the wages paid here, which is still a subject of dispute and may not be settled without a bitter fight involving the usual heavy losses to both employers and employed. It is not altogether clear in fact that the cut at first proposed will be heavy enough to answer the purpose intended, as wages are being lowered in the Welsh works, one of them having recently resumed operations with the severe reduction of 20 per cent. But the American manufacturers are further harried by the indefensible discrimination made against them by our railroads. For the past two years the freight rates to interior points on imported tin plates have been going lower and lower. But during the last six months these rates have been reduced 40 to 50 per cent, and in some cases as high as 60 and 70 per cent, for the benefit of the importer. This imposes a double burden on the manufacturer, who finds himself smitten in the house of those who should be his friends. The Western tin plate makers are more seriously affected by the discrimination in freight rates than those on the seaboard whose market is in their immediate vicinity. President W. B. Leeds of the American Tin Plate Company, at Elwood, Ind., has collated important data on this subject and has furnished the Western press with stirring communications which should have an effect on railroad managers. Mr. Leeds has himself been in the railroad service, resigning a high official position to establish the American Tin Plate Company, and it may therefore be presumed that he knows whereof he speaks. He makes the following comparison of existing freight rates per 100 pounds on American tin plates from Elwood, Ind., and Welsh tin plates from New York.

To	From Elwood.	From New York.
Buffalo	.80.14	\$0.08
Cleveland	.11	.07
Toledo	.09%	.09
Columbus	.08	.09
Cincinnati	.08	.09
Louisville	.10	.10
Nashville	.33	.18
Memphis	.38	.16
Detroit	.10	.07
Indianapolis	.07	.08
Chicago	.09	.10
Peoria	.09%	.10
Milwaukee	.11	.10
St. Paul	.29	.26
East St. Louis	.11	.14
St. Louis	.11	.16
St. Joseph	.33	.24
Kansas City	.33	.25
Omaha	.33	.24

Leavenworth	.33	.27
Sioux City	.33	.24
Denver	.1.08	.48

This is a startling statement. A slight analysis will show how the trade in foreign tin plates is favored. From Elwood to Indianapolis the distance is but 50 miles by rail and the freight rate is 7 cents on Elwood tin plates. From New York to Indianapolis the distance is 826 miles and the rate is but 8 cents on foreign tin plates. The long extra haul on the latter is thus practically annihilated, and the foreign tin plates are given almost even terms. Cleveland is much nearer to Elwood than to New York, but freight rates are arranged in inverse ratio to distance, as Elwood tin plates pay 11 cents and foreign tin plates but 7 cents. The same discrimination applies to trade with Detroit. Chicago is only 165 miles from Elwood, but 9 cents is charged for that short haul, while the imported tin plates are carried from New York, almost 1000 miles, for only 10 cents. It would seem to be bad enough to thus place imported tin plates in the Central Western States on such favorable terms, but the discrimination against domestic tin plates grows worse when Southern and far Western points are considered. Nashville and Memphis, for instance, can be reached much more easily by imported tin plates. The rate to Nashville is \$3 per ton lower than on Elwood tin plates, and to Memphis \$4.40 per ton lower, although Elwood is very much nearer than New York to these points. Foreign tin plates can be laid down at St. Paul and Minneapolis within 3 cents of the rate charged on Elwood tin plates. But the rates to Missouri River points and to Denver seem to have been arranged for the express purpose of driving domestic tin plates out of the market. Although Elwood is 800 miles nearer than New York, a much higher freight rate is imposed. The Denver rate is absolutely prohibitory to the domestic manufacturers. The American Tin Plate Company at one time had an excellent trade in Denver, but now they are absolutely unable to do any business there. Other tin plate manufacturers confirm these statements of freight discriminations, and are imploring the assistance of all American business interests in bringing about a different policy on the part of the railroads. Well may the domestic manufacturers make the charge that the railroads seem to be bent on destroying the domestic tin plate industry for the benefit of Welsh manufacturers.

When it is considered that the trade in foreign tin plates merely gives the railroads one way business, and that only on the finished product, they seem to be standing in their own light. The domestic tin plate industry supplies several tons of freight for every ton of finished product, and the larger the industry grows the more business will the railroads receive. But the managers of the roads directly interested in hauling materials to tin plate facto-

ries and merchandise to the people who are employed in them seem to be equally guilty of this discrimination with managers of other lines not so directly interested. Of these managers President Leeds well says: "They are now appearing before all the Railroad State Commissions and claiming that business handled at less than 1 cent per ton per mile would be an absolute loss, when at the rate of 10 cents per box from New York to Chicago (which is equal to \$2 per ton, 20 boxes making a ton) it shows a rate of  $\frac{1}{10}$  cent per ton per mile; and if they can haul freight at  $\frac{1}{10}$  cent per ton per mile for Welsh manufacturers it would look as though common justice, if not every legislative government, would force them to haul it for the American manufacturer at an equal rate."

## Convict Labor on Roads.

The subject of the competition of prison made goods with those manufactured by free labor was lately referred to in these columns, and the evil effects of the practice of employing prison labor in a manner which in any way inflicts injury on the free workingman, either by reducing his wages to meet the competition of prison made goods or by narrowing the demand for labor in his special line, was commented on. How to employ the energies of convicts so that their labor may be made really useful to the State and at least cover the cost of their maintenance, while at the same time the product of their work shall not conflict with that of honest men outside of prison walls, is one that presents many perplexing features. Perhaps the most satisfactory solution of this question yet found is the employment of convicts in road making. This is an occupation that is not very much sought after by the ordinary laborer, while the condition of the average American country road presents a wide margin for improvement. The subject was recently discussed very thoroughly, after investigation by a committee, at a "good roads" convention in North Carolina, where the system of convict labor on the roads has been in operation for some little time. According to a report presented here the convict made roads in that State were examined and found to be as level and well surfaced as most town streets. The cost of labor per convict was 21 cents per day, including board, clothing, shelter, medical attendance and pay of guards. The actual cost of 50 convicts working 30 days on the roads was \$315; while at ordinary rates for free labor—not always easy to obtain—this work would have cost at least \$975. The convicts are also said to have performed 25 per cent. more work in the same time than the ordinary workingman of that section would have accomplished. It would seem that this method of utilizing the energies of criminals might with advantage be adopted more largely than is now the case.

### Tests of Automatic Fire Sprinkler Heads.

Prof. D. S. Jacobus of Stevens Institute of Technology presents a valuable paper on tests of automatic fire sprinkler heads in the last issue of the *Stevens Indicator*. Some ten years since the New York Board of Fire Underwriters submitted several automatic fire sprinkler heads to President Morton for comparative tests, and since that time all the sprinkler heads and their systems which have been considered by the board have been tested by Professor Jacobus. The present paper gives the results of these trials and describes not only the methods of testing, but also the principal characteristics which a reliable head should possess.

Fire extinguishing systems employing automatic sprinkler heads are of two kinds, the "dry pipe" and the "wet pipe." In the former there is no water in the pipes until the sprinkler head is released by the action of heat and thereby operates a valve admitting water to the piping. The object of this construction is to prevent freezing in the pipes leading to the heads. An important disadvantage of this system is that the water is longer in reaching the fire than in a wet pipe system. In some large plants the time required for the water to travel from the main valve to the head is from 1 to 5 minutes, according to the location of the head. In the wet pipe system the water flows upon the fire at the instant of the release of the head. The heads in the dry pipe system are generally placed in an upright position above the pipe in order that all water may be drained from the system. If they were placed in a pendant position a small quantity might be left in the head and cause trouble by freezing. In the other method the heads are usually placed in a pendant position, in which they are just as efficient as when placed upright, and the piping may be hung against the ceiling.

When sprinkler heads are subjected to long-continued use the following defects may be developed: The valve may stick in the seat after the fusible solder releasing device has fallen apart and released the valve; the releasing device may not fall apart after the fusible solder has melted so that the valve will not be released; the heads may open of their own accord. Sticking was first noticed when gutta percha washers were used, this material, in some cases, becoming so firmly cemented against the seat that the sprinkler would not open at ordinary pressures. Similar defects were found when a lead washer was used against a brass seat. The reliability of the head was increased when a copper disk was introduced between the lead washer and the valve face. Sticking at the valve seat must be especially guarded against, since, if a sprinkler on the top floor of a building is subjected to a pressure of, say, 8 pounds per square inch, the pressure on the

valve will be about  $1\frac{1}{2}$  pounds, as the nozzles of many sprinkler heads are about  $\frac{1}{2}$  inch in diameter. A small amount of corrosion will often be sufficient to overcome this low pressure.

The failure of the releasing device was developed in heads relying in a great measure on the elasticity of the brass frame, or other stiff brass pieces, to operate the releasing device. In some heads tested the force acting on the valve could be adjusted so that no leakage would occur at 40 pounds pressure per square inch, and yet this force would not be sufficient to operate the releasing device after the fusible solder had melted. A head of this kind operates perfectly when new, but not when it has been subjected to the strain for a long time. Opening without the application of heat has been found to be a most serious defect in several forms of heads.

The tests were made to ascertain the following: Reliability of action and sensitiveness; distribution and rate of flow in the open air and under flat and joisted ceilings; durability, in which the sprinklers are connected to short pipes which are filled with water. These tests are made in order to note if the releasing device will open of its own accord, and to determine if corrosion will cause the valve to stick. Professor Jacobus states that the main feature of a sprinkler head is that it shall operate with certainty in case of fire. To test this point the sprinklers are heated in an oven and the reliability of action noted at the same time that the sensitiveness is determined. Another test consists in applying a flame at intervals directly to the heads, in order to imitate the effect of a sudden fire where there are drafts of air. This is done with a gas burner that gives a large heating flame, completely enveloping the head. This test is stated to be a severe one, and sprinklers that will open correctly in an oven will sometimes fail when subjected to it. The main cause of failure in this case is the "starting" of the solder joint sufficiently to permit leaking in such a way as to cool the solder joint and prevent further opening.

The requirements of the New York Board of Fire Underwriters are that with 10 feet water head the distribution 8 feet below the sprinkler head shall be over a circle at least 10 feet in diameter, that the diameter 6 inches above shall be 8 feet or over when tested in the open air, and that the rate of flow shall be at least 1 cubic foot per minute. Sprinklers that distribute the water umbrella fashion, or in streams are not reliable. The best form of delivery is in large drops over the entire area, large drops being disturbed less than mist or spray, which a light draft may change the direction of. In the durability tests the sprinkler heads are mounted as in practice and their action noted at long intervals of time.

A few days since a foreigner visited a large works in Eastern Pennsylvania.

Impressive though the plant was for more than one reason, the most startling result of the visit came to him in one little incident. Among a number of important improvements under way was a powerful mill for rolling shapes. During the inspection one of the proprietors, who was acting as the host of the party, remarked that it was ten years within a month that the mill being displaced was completed. In 1884 the train, then new, was regarded as the greatest in the country, and was the pride not alone of the owners but of the trade at large. Ten years later the whole of the magnificent machinery—engine, train and all—had to wander into the scrap heap, because the works could not afford to be outstripped by others in modern plant. This is a recent and striking illustration of the destruction of capital invested in machinery by modern technical progress, and yet how many American manufacturers introduce as an item in their cost sheets a depreciation account which shall wipe out their plant investment in ten years?

### The Moral Effect of a Technical Education.

The technical school can scarcely be regarded as a teacher of morals pure and simple, but its influence for good is deep and lasting upon the integrity, sincerity and truthfulness of its students.

It is not in human nature to pursue a course of three or four years in such studies as mathematics and the sciences without absorbing some of the spirit of exactness and completeness which governs in every deduction, every theory and every law. The pupil is taught that certain causes must produce certain effects, that in nature there is no actual loss, no return without the requisite expenditure of force or of matter. Nature is perfectly honest, there is no trickery, no uncertainty; physical and chemical action must be in accord with nature's laws. We may or may not know them as yet, but there is system, certainly everywhere.

The absolute truthfulness of mathematics, the transformation of work into heat, and even the mysteries of light and electricity continually lead the student into paths of exactness and train him in accuracy of statement and action. His after life, as engineer, as chemist, as electrician, must of necessity be governed and controlled by the habits thus formed.

He feels that his reputation and character depend upon the accuracy of his statements regarding his work. He is chary about expressing opinions that have no substantial foundation. He becomes just in his judgment; it is second nature to him to look at both sides of a question, and he always desires to take an unprejudiced view of the case.

In point of fact he frequently becomes so candid and so impartial as to assure his failure as a salesman, and to his credit be it said that he very sel-

dom possesses the qualifications necessary to success where negotiations must be carried on with "boodle aldermen" and stubborn committeemen who yield only to the persuasiveness of the almighty dollar; upon them words of reason and logical argument are worse than wasted.

That the above is a faithful pen picture of all technical graduates can hardly be claimed, but that the influence of his studies may be seen in the later life of any man, and that, other things being equal, he is more sincere, more honest and more just than he would have been had he not pursued a technical course, cannot be questioned.

#### Chicago Prices for Tank Steel.

We have been permitted to copy the following table showing the course of prices paid during the past four years for tank steel by a leading Western railroad company, per pound, f.o.b. cars, Chicago:

Months.	1891. Cents.	1892. Cents.	1893. Cents.	1894. Cents.
January.....	2.50	2.20	2.00	1.55
March.....	2.45	2.20	1.90	1.37½
May.....	2.40	2.10	1.85	1.30
July.....	2.30	2.05	1.75	1.40
September...	2.30	2.05	1.75	1.40
November...	2.20	2.00	1.70	...

This table shows that during the entire period covered the decline in prices was almost unbroken, the first symptom of a check appearing in July of the present year. Low water mark was touched in May, but, as is well known, the coke strike then prevailing caused an advance in Bessemer pig iron and steel billets, which, of course, compelled an advance in tank steel. The higher rate ruling since that time was not due to an improvement in general business. It may be idle to speculate on this phase of the subject, but the question will suggest itself, How low would prices have gone if the coke strike had not occurred?

#### OBITUARY.

B. O. DANA.

B. O. Dana, president of the Dana Hardware Company, Boston, died at his residence in that city on the 31st ult., after a six months' illness with a complication of diseases. Mr. Dana was the son of O. D. Dana, and upon the death of the latter about a year and a half ago succeeded him as president of the well-known company which bears their name. The deceased was 34 years of age and leaves a wife and child, a boy of eight years. Mr. Dana was a member of St. Paul's Lodge, Royal Arch Chapter and St. Omar Commandry of Masons; also of the South Boston Yacht Club. The funeral was held on the 4th inst.

The aggregate length of telegraph lines in existence throughout the world is computed at 1,069,123 miles. The total is made up as follows: Europe, 382,937 miles; Asia, 67,875 miles; Africa, 21,687 miles; and Australasia, 47,812 miles. This leaves 548,822 miles for America.

## CORRESPONDENCE.

### The Validity of a Note Dated on Sunday.

To the Editor: The law says "A note made on Sunday is void."

"A" wishes to settle a transaction which expires on October 28 (Sunday) by having paper discounted. He on Wednesday prior to above makes out his paper and proposes to offer it for discount first discount day, which is succeeding Friday.

"B" contends that the note, which is dated 28th, to even up transaction, is worthless on account of date being Sunday.

"A" contends that the spirit of the law is to prevent Sunday labor and that the dating of the note as above does not violate the law, the work not being done on Sunday and the evidence (communication offering for discount) being proof of work being done on a secular day.

Which is right? Yours,  
PIG IRON.

"A" is right. The note is valid and can be enforced even though it is dated on Sunday, provided it is not delivered or transferred or discounted on that day. We believe the law to be uniform on this point in all the States and have been unable to find any decision to the contrary.

It is somewhat extraordinary that contracts made or labor done on Sunday were not unlawful at common law. The statute of 27 Charles II in 1672 contains the first prohibition. And so in the various States whether an act is unlawful or not if done on Sunday depends not on the general rules of the common law, but on the precise language of the particular statute, and these statutes vary very materially. The object of the statute is to prevent labor on the Sabbath, and particularly manual labor. It is a provision for the benefit of workingmen and was not intended to disturb or impair the validity of contracts and for this reason the courts construe the statute very narrowly. The tendency is to hold contracts made on Sunday to be valid if there is a possible loop hole in the language of the act.

In Massachusetts, for instance, it was recently held that "a note dated on Sunday, but made and delivered on a secular day, is binding." Stacy vs. Kemp, 97 Mass. Law Report, page 166. The Illinois courts have decided the same way. Indiana goes still further. The courts there hold in the face of the statute that "a deed, though signed and acknowledged on Sunday, is valid if delivered on another day." Of course, the same rule applies with equal force to a note. In Pennsylvania it is held by the courts that the mere signing of any instrument on Sunday will not make it void, if it is not to take effect until delivery. Even in Vermont it was held that a contract for work to be done which was partly made on Sunday was valid because it was not made legally complete till Monday.

But the courts of New York go much further than those of the other States. An agreement or contract compromising a suit and made on Sunday has been held valid by the Court of Appeals. In another case a private sale of property on Sunday was held to be an enforceable contract because the statute says no one shall "expose" goods for sale, and where the sale was private—between two parties—the statute does not prohibit. This is a very recent de-

cision of the Court of Appeals. Contracts of advertising in Sunday papers are held valid. This is probably so, however, because the statute in its terms permits such work to be done on Sunday. The Western States, as a rule, follow the decisions of New York in this matter and as we have said the constant tendency is to allow contracts to be legally made on Sunday, provided such contracts do not call for actual physical labor on that day.

### Hydraulic Forging.

To the Editor: I have, in the first place, to thank you for the compliment you have paid me in allotting so much of the valuable space in your issue of September 6 to my paper on "Hydraulic Forging." I see, in your issue of September 20, a letter from W. H. Wood, who sent me copy of this, but after he had sent it to you. My reply to him will, however, answer his letter to you, and was as follows:

MEDIA, DEL. CO., LA., U. S. A., }  
October 6, 1894.

"W. H. WOOD, Esq., Engineer:

"DEAR SIR—I am in receipt of yours of 19th September. I have not seen the article in *The Iron Age*, so do not know what it contains, but in the original paper, with discussion, of which I have sent you a copy, you will find that in the discussion I. A. Aspinall referred to the matter, and goes even one better than the invention of your father. My authority for giving Sir Joseph Whitworth the credit is that of Professor Greenwood and from general report.

"It is of course quite possible that Sir Joseph's thoughts may have been directed into the particular channel, as you say, but I do not think your father, who undoubtedly was an able man, is alone in having his ideas appropriated without acknowledgment by others.

"Thanking you for your courtesy, I remain, yours very truly,

(Signed) "RALPH TWEDDELL."

The man who anticipated Mr. Wood's father was called "Hollenrahe;" he took out one patent so far back as 1818 and a second in 1819, and not only took out the patents but actually applied pressure to copper ingots and talked of using hydro-mechanical power for the purpose. In my paper I find I say:

"It is of course not difficult, and to some minds a congenial task, to hunt for and find something in the records of the Patent Office which may appear to anticipate the results obtained by any one who successfully introduces a new system."

Had Mr. Wood not himself opened up the question, I should not have thought it worth while to go into the matter, but I see no reason to deprive Sir Joseph Whitworth of the credit due to him for his application of fluid pressure to steel; he it was who risked an enormous capital, and after all it is quite possible that he had the whole thing in his mind when the conversation with Mr. Wood took place.

RALPH HART TWEDDELL.  
WESTMINSTER, October 22, 1894.

A mechanical device has recently been introduced into the 28-inch mill at the Homestead Steel Works, Homestead, Pa., which places the ingots in the heating furnaces and withdraws them. The introduction of this device has done away with the services of quite a number of skilled men.

## PERSONAL.

At the annual meeting in December of the American Society of Mechanical Engineers the following ballot will be voted upon: For president, E. F. C. Davis, Richmond, Va.; for treasurer, Wm. H. Wiley, New York; for vice-presidents, F. H. Ball, New York; Jesse M. Smith, Detroit, and M. L. Holman, St. Louis, and for managers, John C. Kafer, New York; Chas. A. Bauer, Springfield, Ohio, and Arthur C. Walworth, Boston.

Hudson Maxim, chief engineer and manager of the Maxim Powder & Torpedo Company of New York, met with a serious accident last week at Maxim, N. J., the explosion of a disk of fulminate compound shattering his left hand. Mr. Maxim, who is a brother of Hiram Maxim, the inventor of the Maxim gun, is himself a well-known inventor, and the compound which caused the accident is a material recently invented and patented by him for setting off high explosives.

The Crescent Steel Company's Chicago branch loses the services of Albert L. Butler, who has been manager for 20 years, but is obliged to resign on account of his health. The company have appointed as his successor H. H. Miner, one of Mr. Butler's assistants for many years. The trade will hear of Mr. Butler's retirement with much regret.

## San Francisco News.

SAN FRANCISCO, October 29, 1894.

There is an important movement now in embryo here which, if successful, may have lasting and far reaching consequences. One of the smartest business men of the day is the gentleman whose name is at the head of the Union Iron Works and who may be regarded as the father of iron and steel shipbuilding on this coast. He has succeeded where many other men would have failed and has overcome almost insuperable obstacles. He has laid the foundation of a vast industry on this coast, but that industry may be said to be still in its infancy. One of the great obstacles in the way of that industry here is the heavy taxation for local and State purposes. It is proposed, or rather it will be proposed at the next meeting of the State Legislature, that for all vessels built in the State of California the port of San Francisco shall be a free port. Should this proposal be made a law it will lift a great burden from shipping belonging to the port of the State and built anywhere within its borders. It would help to reduce the cost and narrow considerably the margin between the cost of building here and at the shipyards of the East or on the Clyde. Vessels owned here have to pay these taxes every year, and making all due allowance for the fact that they are not assessed at the full value as shown by the cost of construction, still it is evident that in, say, 20 years a very great proportion of the latter would be made. In this way the difference now subsisting against San Francisco as to cost of construction would be nearly, if not altogether, offset and this city would become the center of one of the greatest shipbuilding industries in America. In fact, it is certain that it would become the great iron and steel shipbuilding center of the Pacific, and it is not without the limits of probability that China

and Japan would come here to have their men-of-war and commercial vessels built. And we may add that were any large proportion of the vessels trading to and from the port of San Francisco built here it would make the city so much richer by the freight money that would remain here. The movement for free shipping is, however, only a part of a whole where the Legislature is to be called upon to favor California manufacturers in the matter of taxation. There is to be a concerted movement in this matter and a convention will probably be held in this city to take steps to influence the Legislature in this regard. It is more than likely that the new Legislature will regard with favor whatever the recommendations of such a body would be.

The general conditions of business are favorable, considering the season of the year and the fact that we are recovering after a very bad dose of bad times. The sale and shipment of wheat, albeit at very low prices, is going on in great volume just at present, while the shipment of fruit by rail is larger than ever known in our history. The result is that a great deal of money is being distributed among producers and that they are making a good many improvements. Trade is, therefore, stirring where a couple of months since it was almost at a complete standstill. The hardware and iron trades get their full share of the benefits resulting from the improved order of things and sales by jobbers in these and kindred lines have of late improved quite considerably. It is likely that this improvement will continue for some little time, say for a month or so longer, when the business of the year usually comes to an end. This refers more particularly to bar iron and steel and hardware. There is some demand still for plows, cultivators and other seasonable articles and there are moderate receipts of them. There is also a fair demand for our home production of such goods. As regards our import trade by rail it spruced up a bit during the past week or so, receipts being much heavier than for a long time past. The leading factor during the time noted has been bar iron, though iron pipe still cuts quite a respectable figure. There have been some importations of pig iron too, but not of any great volume. The importation of nails by rail has, however, been somewhat larger than usual during the past month and there has been a better demand for them too. Here the price has not varied at all from that which I sent you some time ago—\$1.50 as a base for iron and steel. The last clipper arriving here brought a good deal of hardware, &c., of various kinds, but we do not seem on the whole to be receiving much that way. Our imports of pig tin have been very light for some time. The last steamer from Sydney brought none, and, indeed, as the canning season is about over and as people are in no hurry to buy for the next season, that is scarcely to be wondered at.

An association under the name of the Monterey Mineral Railway & Terminal Company has been organized in Baltimore, and chartered under the laws of the State of West Virginia, with the object of enlarging the trade of Baltimore with Mexico, and to help develop the resources of the Southern republic. Wm. Johnston of Liverpool, England, president of the Johnston line of steamships, was chosen president of the new corporation; Charles K. Lord, third

vice-president of the Baltimore & Ohio Railroad, vice-president, and John Gill secretary-treasurer. The principal office of the company will be in Monterey, while its chief office in the United States will be located in Baltimore. The company propose among other things to acquire terminal properties in Baltimore and certain Mexican ports, and to secure lands in Mexico that contain silver and other ores, to build smelters and to ship the refined product to the United States. A service of steam vessels, a railroad, wharves, piers, warehouses, and other adjuncts of trade will be built and owned by the corporation, who propose to obtain concessions from the Mexican Government to further the extension of trade between the two countries.

In a large number of manufacturing concerns in Massachusetts, the affairs of which are covered by the latest report of the State Bureau of Labor Statistics, "there were 43,803 partners or stockholders in 1893, against 42,735 in 1892. The number of males included in the total for the latter year was greater, however, than that which was covered by the larger figures for 1893. There were 27,325 male partners or stockholders in 1892 and 27,211 in 1893. On the other hand, the number of women who had an interest in the manufacture dealt with by the report was 16,592 in 1893, against 15,410 in the year preceding. The partners or stockholders were 63.94 per cent. males in 1892 and 27.56 per cent. females. In 1893 the proportions were 28.38 per cent. females and 62.12 per cent. males.

United States Labor Commissioner Carroll D. Wright has lately presented some interesting figures showing the changes that have taken place in the wages of labor in the past half century, which exhibit a remarkable improvement in the condition of the wage earner during that period. He shows that wages were much higher and the cost of living materially lower in 1892 than they were 50 years before. Thus laborers in a New York brewery received 62½ cents a day in 1840, 84 cents a day in 1860, \$1.30 a day in 1866, and from \$1.50 to \$2 a day in 1891. Carpenters earned from \$1.25 to \$1.62 per day of ten hours in 1840, about the same in 1860, and from \$3 to \$3.25 per day of eight hours in 1891. Wheelwrights received \$1.25 per day in 1840, the same in 1860, \$2 in 1866, and \$2.50 in 1891. Cotton weavers were paid 62 cents per day in 1840, only 54½ cents in 1860, 85 cents to 90 cents in 1866, and \$1.05 in 1891. Wool spinners received something under \$1 per day in 1840, \$1.05 in 1860, \$1.80 in 1866, and \$1.38 to \$1.75 in 1891.

The Marinette Iron Works Company of Duluth, Minn., are manufacturing a new pump invented by L. D. Libbey for pumping mud, sand and gravel. It is stated that a thorough test showed a pumping capacity of 200 cubic yards of sand and gravel per hour. In this pump blades are placed which are made on the same principle as a propeller's screw, and it is claimed that they will be very durable.

Western glass factories are greatly interested in the recent discovery of a large deposit of suitable sand near Anderson, Ind. It is a material of which they have been greatly in need, being obliged to transport it from distant localities.

## An Increase in Pig Production.

Production has increased further until now in the Central West the make is close to the maximum attainable. The improvements made in the equipment at a number of the furnaces during the idleness caused by the coke strikes is telling in the make of a number of stacks.

On November 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity:

Fuel.	No.	Capacity per week.
Anthracite	36	18,600
Coke	123	135,572
Charcoal	22	4,694
Totals November 1	181	158,866
Totals October 1	172	151,135
Increase or decrease	+ 9	+ 7,731

The weekly product of all the furnaces on November 1 compared as follows with that of preceding periods:

Furnaces in blast.	Capacity per week.	Gross tons.
November 1, 1894	181	158,866
October 1	172	151,135
September 1	171	151,113
August 1	135	115,356
July 1	107	85,950
June 1	88	62,517
May 1	127	110,210
April 1	144	126,732
March 1	133	110,166
February 1	125	99,242
January 1	120	99,087
December 1, 1893	130	99,379
November 1	117	80,070
October 1	114	73,895
September 1	125	83,484
August 1	169	107,042
July 1	220	153,762
June 1	244	174,029
May 1	251	181,551
April 1	255	178,858
March 1	255	176,978
February 1	251	171,201
January 1	246	173,088
December 1, 1892	246	176,271
November 1	244	171,082

The status of the coke furnaces was as follows:

Coke Furnaces, November 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	5	2	2,764	8	3,300
Pennsylvania : Pittsburgh District.	25	23	37,737	2	1,580
Spiegel	2	2	1,838	0	0
Shenango Val.	17	14	16,153	3	1,550
Juniata and Conemaugh Valley.	14	5	6,132	9	3,526
Spiegel	1	1	686	0	0
Youghiogheny Valley.	3	1	900	2	1,405
Miscellaneous.	4	2	1,434	2	1,250
Maryland	5	0	0	5	6,000
Wheeling District	8	6	4,274	2	2,400
Ohio : Mahoning Val. Central and Northern.	14	9	11,068	5	3,700
Hocking Val.	12	0	6,491	3	1,938
Hanging Rock	13	7	1,525	6	2,081
Indiana	2	0	0	2	412
Illinois	19	9	15,188	10	9,420
Minnesota	1	0	0	1	629
Wisconsin	5	1	1,214	4	2,938
Missouri	6	0	0	6	3,572
Colorado	3	2	2,091	1	600
The South : Virginia	22	10	6,148	12	7,385
Kentucky	6	2	720	4	3,118
Alabama	38	13	19,834	25	10,150
Tennessee	14	6	4,680	8	3,150
Georgia	2	1	590	1	600
N. Carolina	1	0	0	1	97
Totals	252	123	135,572	129	73,942

As compared with previous months the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
November 1, 1894	132	135,572
October 1	19	129,951
September 1	112	125,879
August 1	79	94,707
July 1	53	68,878
June 1	40	47,104
May 1	75	88,580
April 1	92	105,011
March 1	83	89,794
February 1	80	81,970
January 1	80	81,997
December 1, 1893	72	78,241
November 1	57	58,820
October 1	52	53,061
September 1	54	56,976
August 1	84	77,907
July 1	122	117,072
June 1	140	132,079
May 1	146	139,788
April 1	145	135,488
March 1	145	133,579
February 1	140	129,396
January 1	138	131,731

The status of the anthracite furnaces was as follows:

Anthracite Furnaces, November 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	14	2	1,280	12	5,173
New Jersey	10	2	974	8	3,679
Spiegel	3	3	253	0	0
Pennsylvania : Lehigh Valley	39	11	4,976	28	11,010
Spiegel	1	0	0	1	65
Schuylkill Valley	27	6	3,837	21	8,919
U. S. Susquehanna Valley	15	2	1,435	13	4,511
L. S. Susquehanna Valley	14	3	2,200	11	4,025
Lebanon Valley	13	7	3,645	6	3,207
Totals	136	36	18,600	100	40,679

For a number of months past our records of active anthracite furnaces show the following:

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.
New England	13	3	220
New York	5	1	105
Pennsylvania	13	1	42
Maryland	6	0	0
Virginia	13	0	13
Ohio	9	3	172
Kentucky	3	0	3
Tennessee	9	1	100
Georgia	3	1	263
Alabama	13	3	561
Michigan	20	5	1,654
Missouri	1	1	293
Wisconsin	5	2	1,159
Texas	4	1	125
Washington	1	0	0
Oregon	1	0	0
Totals	119	22	4,694
			97
			13,892

An interesting event of the month was the blowing in of what is practically a new modern furnace at Poughkeepsie, thus showing an encouraging sign of vitality in the Hudson River district. In the Schuylkill Valley one Keystone stopped and one Swede and Temple started. In the Lehigh Valley the Bethlehem Iron Company have an additional furnace going.

### Stocks.

The position of stocks, sold and unsold, as reported to us November 1, was as follows, the same furnaces being represented as in former months:

Stocks.	Sept. 1.	Oct. 1.	Nov. 1.
	Tons.	Tons.	Tons.
Anthracite pig	116,833	105,287	96,857
Coke pig	197,877	197,427	196,112
Charcoal pig	217,554	221,998	219,351
Totals	532,264	524,712	512,320

Although our figures do not include the quantities held by the large steel companies East and West, they serve to indicate pretty accurately that a slight reduction in stocks took place during October.

Happily gold exports have ceased *pro tem.* Although the condition of foreign exchange at the close of last week would have justified the shipment of gold, none of the precious metal was sent out, and since that time the exchange market has become easier in tone. The offerings, especially of grain bills, early in the week were large and sufficient to meet all the demands from remitters. The future course of the market in relation to gold shipments will depend entirely on the foreign demand for securities and the supply of commercial bills.

## MANUFACTURING.

### Iron and Steel.

For two or three years past the Carnegie Steel Company, Limited, of Pittsburgh have had under consideration the question of the erection of blast furnaces at Duquesne, Pa., to supply the Duquesne Steel Works with pig metal. As it is now the pig used at this plant is made at Bessemer, Pa., and is then taken across the Monongahela River to Duquesne, the cost being estimated at close to 25 cents per ton. About a year ago the scheme of taking hot metal from Bessemer to Duquesne was tried at considerable cost, but was abandoned as impracticable. Recently the concern have secured additional ground at Duquesne and plans have been drawn for the erection of four furnaces at Duquesne, work on which will probably be commenced early in 1895. The furnaces will be largely modeled after furnaces H and I, at Bessemer, and will have a capacity of turning out from 350 to 400 tons each of pig iron every 24 hours. The further announcement is made that Thomas Rottlöff has been engaged to superintend the construction of the new furnaces. Mr. Rottlöff was formerly superintendent of the blast furnaces of the Carrie Furnace Company of Pittsburgh, but recently severed his connection with that concern. Since the installation of the large new blooming mill at the Duquesne Steel Works early in the year some phenomenal records for output have been made. As high as 1800 tons of billets have been turned out in 24 hours, and the average daily production right along is close to 1500 tons. The blooming mill in question was built by Mackintosh, Hemphill & Co. of Pittsburgh.

From reliable sources comes the information that the plant of the Keystone Bridge Works of the Carnegie interest, at Pittsburgh, will be removed to Homestead, Pa., during the coming year. Plans for the new buildings have been completed for some time and are now in the hands of the chief draftsman at the Homestead Steel Works. The buildings are to be erected on the ground now occupied by the red tenement houses and the race track. The capacity of the new plant for turning out bridge material will be much in excess of that of the present works in Pittsburgh.

The best previous record for production of rails at the Edgar Thomson Steel Works, Bessemer, Pa., was surpassed during the month of October, the production reaching 35,900 tons. In one 12-hour turn 1800 tons were turned out and on the other turn 1790 tons. The best previous record for production in any one month at this plant was about 33,000 tons.

C. W. Bray, formerly mechanical engineer for the Lloyd Booth Company, Youngstown, Ohio, has accepted the presidency of a new company organized at New Lisbon, Ohio, and who will erect a tin plate plant at that place. The main building will be 100 x 200 feet, and all the buildings will be of iron. The contract for their erection has been given to the Younstown Bridge Company of Youngstown, Ohio.

The plant of the Greensburg Steel Company, Greensburg, Pa., which has been idle for several years, and is at present owned by J. C. Jamison of Pittsburgh, will probably be put in operation in a short time. A new crucible furnace of 12 pots has recently been added to the plant.

The Ironton Structural Steel Company of Duluth, Minn., are running their new mill on 12-inch beams for stock. Some time this month they expect to have their large mill in operation, rolling 36-inch beams. These mills have been built under patents of James E. York.

The plant of the Latrobe Steel Works, Latrobe, Ohio, manufacturers of locomotive tires, is in full operation on double turn in all departments.

The Elliott Steel Company, New Castle, Pa., manufacturers of fine cold rolled steel and hot rolled steel, have been dissolved and have been succeeded by a new concern known as the Elliott-Washington Steel Company, who will continue the manufacture of fine rolled strip steel, suitable for parts of sewing machines, bicycles, typewriters and other articles of manufacture in which rolled steel is used. This firm are making a specialty of the manufacture of what is termed "dead soft" cold rolled steel by their own process, for which they claim many points of superiority. The Elliott-Washington Steel Company are com-

posed of Geo. Elliott, W. L. Washington, Noah W. Elliott and Thomas C. Elliott.

The Hartman Mfg. Company of Ellwood City, Pa., are building an additional factory 50 x 100 feet in size, which is expected to be completed and ready for occupancy by December 1 next.

The Ellwood Shafting & Tube Company, Ellwood City, Pa., are erecting a steel building 80 x 80 feet; and otherwise considerably increasing their capacity for the manufacture of seamless tubing, which is known to the trade as Hartman seamless tubing. With the new addition to this plant the floor space will cover almost 1½ acres.

The Edith Furnace of the Hainesworth Steel Company, Allegheny, Pa., under the management of John Reis, made during the month of October, just closed, 7744 gross tons of Bessemer iron. The largest record for one week was 1800 tons and for one day 282 tons. This excellent record was made on a mixture of two-thirds Mesaba ore, using less than 1 ton of coke to 1 ton of iron.

The Cleveland Rolling Mill Company of Cleveland, Ohio, recently produced over 79,000 cut hoops, 1½ inches wide and No. 18 gauge, in 11 hours, and expect to add such improvements in the near future as to double the capacity. James Ring, formerly with the Union Iron & Steel Company of Youngstown, Ohio, has charge of this mill.

Pine Grove Furnace of the South Mountain Mining & Iron Company, in Cumberland County, Pa., is undergoing repairs, preparatory to blowing in about two weeks.

The furnace at Round Mountain, Ala., will go out of blast in a few days.

At Lake View, Wis., the work of building the new rolling mill is going rapidly forward. The frame is up and the foundations for the machinery laid. The mill will be ready for operation, it is thought, by March 1 next.

The final arrangements for locating the Newark Machine Works, at Newark, Ohio, have been made, and the work of erecting the plant will be pushed forward as rapidly as possible.

The blast furnace of the Spring Lake Iron Company, at Fruitport, Mich., is about ready to resume operations.

W. P. Worth & Bro. of Coatesville, Pa., will, it is stated, erect new tube works providing the proper concessions are granted by the borough officials.

An error, which probably grew out of the similarity of names, was made in these columns last week, in using the name of the Colorado Fuel & Iron Company instead of that of the Colorado Coal & Iron Development Company. It is the latter company, and not the Colorado Fuel & Iron Company, who have issued a circular and a plan providing for the payment of accruing interest, &c. These are two separate and distinct companies, the Colorado Fuel & Iron Company operating blast furnaces and steel works at Pueblo, and the Colorado Coal & Iron Development Company being chiefly interested in real estate in and adjoining Pueblo.

### Machinery.

The Edward P. Allis Company of Milwaukee have secured contracts for four 1000 horse-power engines for the Metropolitan Elevated Railway Company of Chicago, to be used in operating their electric equipment.

The Phoenix Mfg. Company of Eau Claire, Wis., have broken ground for new machine shops, to be 45 x 160 feet in size, built of stone and arranged with traveling cranes and heavy machinery. The company's contract stipulates that all workmen shall be residents of Eau Claire.

The machine shop and round house of the Baltimore & Ohio Railroad, at Bellaire, Ohio, were destroyed by fire last week. The loss is estimated at \$10,000.

The Hudnut Foundry & Machine Works of Big Rapids, Mich., and the Ivens Mfg. Company of New Orleans are reported to have arranged for the removal of their machinery to Meridian, Miss., where their interests will be consolidated as the Interstate Iron Works Company.

The Philadelphia Engineering Works of Philadelphia have just completed contracts with the Carnegie Gas Company, Pittsburgh, for three 30 x 60 inch gas compressors. Each is driven by a 32 x 60 inch Philadelphia Corliss engine of their rolling mill type. They have also con-

tracted with the Pittsburgh Natural Gas Company of Pittsburgh for a pair of 30 x 60 gas compressors, each driven by a 24 x 60 inch Philadelphia Corliss engine. Also a pair of 30 x 60 inch gas compressors for the Ohio Valley Gas Company, each driven by a 26 x 60 inch Philadelphia Corliss engine. They have also just contracted with Marshall Bros. of Philadelphia for an 800-horse-power tandem compound condensing engine of their rolling mill Corliss type to drive their tin plate mills. They are just shipping for the Chamberlain Coal Company of Pottsville, Pa., two 32 x 60 inch Philadelphia Corliss hoisting engines complete with drums, brakes, &c., and two 14 x 36 heavy Corliss engines for the same company to be used for their coal breaker. They are delivering to the Standard Steel Works, Burnham, Pa., a 15-ton revolving open hearth steel furnace, together with gas producers, piping and chimneys.

The Lodge & Davis Machine Tool Company of Cincinnati, Ohio, have just issued a circular illustrating and describing their full line of universal and plain milling machines.

The efficiency and economy of the Buffalo forced draft system is attested to by W. F. Sauber, engineer of the steamer "Wm. H. Gratzwick No. 2," who states that the system as installed in that vessel is a complete success. A saving of more than 10 per cent. in better combustion was found in the forced draft than in natural draft. A car of slack coal was tried on a recent trip, when the engine was worked for two and a half hours full speed, and more steam was generated than was necessary for use.

In *The Iron Age* of October 25 was presented an illustrated description of the Union reversible face plate jaw made by the Union Mfg. Company. In that article we gave the factory address of the company as New Haven, when it should have been New Britain, Conn. The warehouse address, 103 Chambers street, New York, was correct.

The new boiler shop of the Aultman-Taylor Company, at Mansfield, Ohio, will be 300 x 100 feet in size. It is stated that electricity will largely supersede steam in the operation of the machinery.

The Frank-Kneeland Machine Company, Pittsburgh, manufacturers of iron and steel works machinery, have the tin plate plant for Goldsmith, Lowenberg & Co. of New Kensington, Pa., nearly ready for shipment. It includes all the machinery for a four-mill plant. The Frank-Kneeland Machine Company have just added a third Shaw electric traveling crane of 20 tons capacity to their equipment, and have also made other additions to their machinery, which will materially increase the capacity of their plant.

### Hardware.

J. Renek's Sons' rope and twine factory, at Easton, Pa., which has been idle since last May, has resumed operations with a force of about 100 hands.

The shoe knife manufactory of Matthew George, at Mansfield, Mass., was burned on the 29th ult. Loss \$4000; partly insured.

Clark Bros. & Co., Southington, Conn., have decided to erect an addition to their plant which will be used as warehouse and office. The building will be about 80 feet long and 30 feet wide, and will consist of two stories and basement.

The Turner Mfg. Company, Brooklyn, N. Y., have been organized for the manufacture of hardware specialties. The capital stock is \$45,000.

The Hubbell Sulky Harrow Company of Milwaukee, Wis., have been incorporated, with a capital stock of \$125,000.

The organization of the Universal Fastener Company of Chicago, Ill., is announced. The company's capital is \$300,000. The incorporators are Whitcomb L. Judson, William D. McIlvaine and Thorne D. Earle.

F. E. Myers & Bro., Ashland, Ohio, have just completed a brick addition to their already extensive factory. The new building is 50 x 175 feet and three stories high. It will be completely equipped with the best machinery on the market. This new building, with other improvements in their plant, will increase their capacity about one-third.

The Hansen-Huennekens Cycle Company of Madison, Wis., have filed an amendment to their articles of incorporation, changing the style of the company to the Huennekens Cycle Company.

Penn Hardware Company, Reading, Pa., are working five days a week, nine hours a day, with a force of 500 employees. They state that their business in the finest grades of hardware has improved considerably during the past year. They also state that they have commenced manufacturing a full line of cylinder lock work.

Stover Mfg. Company, Freeport, Ill., advise us that they are having an excellent trade in wind mills and grinding mills. Sales of these goods are larger than the company have heretofore known.

#### MISCELLANEOUS.

The power station for the Nassau Electric Railway Company, at Brooklyn, N. Y., will be 102 feet wide and 150 feet long, and will be constructed entirely of iron and steel, the whole designed and built by the Berlin Iron Bridge Company, East Berlin, Conn. The roof will be covered with their well-known patent anti-condensation corrugated iron roof covering.

Randolph & Clowes of Waterbury, Conn., have placed the contract for the extension to their muffle room with the Berlin Iron Bridge Company of East Berlin, Conn.

The Youngstown Car Mfg. Company, Youngstown, Ohio, are erecting an addition to their plant.

Committees of the creditors of the C. Aultman Company, the Sun Vapor Street Light Company, both of Canton, Ohio, and the Akron Iron Company, Akron, Ohio, are trying to effect a settlement.

The plant of the Westinghouse Air Brake Company, Wildermin, Pa., commenced this week to work full time, after running four days a week, of seven hours each, for the past year and a half.

William Deering & Co., are erecting a large twine factory in connection with their harvesting machine works at Chicago. The building is three stories high and covers an area of 266 x 140 feet. It is built of brick, the interior being of modern mill construction. The mill will have 600 spindles and will have a daily capacity of 40 tons of finished twine. The power will be supplied by the 3000 horse-power Allis engine which operated the intramural railway at the World's Fair. This will be the largest mill west of the Alleghenies and one of the largest in the world. In addition to this the Deerings are building a new twine warehouse, three stories, 90 x 288 feet. It will have a storage capacity of 5000 tons of fiber.

Another smelter is to be built for the Lanyon Smelting Company of South Waukegan, Ill., manufacturers of spelter. Its capacity will be about the same as the one now running, which is about 60,000 pounds per day. It will be modeled after the old one, with the same kind and number of retorts and condensers. The company found it impossible to fill all their orders and were compelled to enlarge their business.

The H. K. Porter Company of Pittsburgh, manufacturers of light locomotives, have just completed a narrow gauge engine for shipment to South America.

A committee of the bondholders of the United Brass Company of Lorain, Ohio, have recently examined the plant with a view of putting it in operation at an early date.

The plant of the Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, has been completed and thoroughly equipped with modern machinery. The new plant is located at Hasletton, a suburb of Youngstown, and the location is an excellent one, both for shipping and receiving purposes. The firm have already received quite a number of orders for iron and steel roofing, and have furnished the siding and roofing material for the new building of the Union Iron & Steel Company, Youngstown, Ohio. The new firm have opened branch offices in New York, Chicago, Buffalo, Pittsburgh and Richmond, Va.

Boston Bridge Works, Boston, Mass., have recently completed a notable piece of structural work in the Worthington Building, corner State and Congress streets, Boston. This building is a ten-story office structure of irregular shape, being 87 feet long by 38 feet at one end and 25 feet at the other. Its frame is entirely of steel and its construction generally is unusually heavy. One of its unique features is the use of built girders instead of eye beams, which is designed to give additional shape and stiffness to structure. The frame is to

be inclosed in a masonry shell of stone and brick.

The factory of the Bettendorf Metal Wheel Company, at Davenport, Iowa, has been burned, at a loss estimated at \$40,000; insured for \$18,000.

The Crescent Sheet & Tin Plate Company, composed principally of Cleveland, Ohio, capitalists, have recently been granted a charter of incorporation. The new concern have purchased land at Newburg, situated outside the city limits of Cleveland, and will erect thereon a modern four-mill tin plate plant with capacity for turning out between 2000 and 3000 boxes of tin plate each week. The buildings will be entirely of iron and the contract for their construction will be let during this week. The contract for the rolling and shearing machinery, consisting of four 24 x 32 inch hot mills, four 20 x 30 inch cold mills, four 32 inch doubling shears and engines, two 36 inch squaring shears, one 6 x 1 inch bar shears and engine, and a 36-inch roll lathe, has been awarded to the Frank-Kneeland Machine Company of Pittsburgh, Pa. The contract for the engines was given to the Rankin & Fritsch Foundry and Machine Company of St. Louis, Mo., and consists of a 34 x 72 inch engine for driving the hot mills and a 24 x 48 inch engine for driving the cold mills. It is expected to have this plant in operation about March, 1895.

The coal, coke and pig iron business formerly carried on at Buffalo, N. Y., by E. L. Haistrom, deceased, has been purchased by Anna M. Hedstrom, Arthur E. Hedstrom and Alice Hedstrom Douglas, who will continue to conduct the business under the firm name of E. L. Hedstrom. Arthur E. Hedstrom, who was associated with his father, will assume the management of the business.

An order in council has been issued by the Canadian Government amending the regulations governing the payment of drawbacks on duties on articles entering into the construction of goods manufactured in the Dominion for export. Hereafter 99 per cent. of the duty paid will be refunded instead of 90 per cent. The change will place Canadian manufacturers in an extremely favorable position to compete in foreign markets with the manufactured products of other countries.

Officials of the Pennsylvania Railroad Company have decided to increase the standard of weight of steel rails on its main line from 85 pounds to 100 pounds. On the recent tour of inspection this matter was given considerable attention, and the change was only deemed advisable after the matter had been thoroughly discussed. The change to go into effect next year, and all new rails between Jersey City and Pittsburgh will be of the new standard. The increase in weight is principally due to the heavier locomotives which the company have gradually been acquiring, besides the increase in speed. The 100 pound standard is a big jump from the weight rail used years ago. Then 56 pounds was considered heavy enough, but soon the weight was increased to 67, then to 75, and then to 85 pounds. The last weight has been the standard for several years, and to all appearance has met the requirements.

A few years ago 100-pound rails were placed in various sections of the road for experimental purposes, and as they fulfilled all that was expected of them, it was decided to use this weight as the standard until further change. Besides increasing the weight there will be, in all probability, a change in the length of the rail. At present a 30-foot one is generally used,

although in some places they are twice that length. The length of the majority of the new rails will be 60 feet. This is a saving of joints, thus giving a smoother surface.

General Flagler, Chief of the Bureau of Ordnance, in his annual report states that carriages for modern guns have been already constructed at the Watertown arsenal. These include 42 inch gun luff; and non-disappearing carriages, and 8-inch non-disappearing carriages, while there are at present being built barbette carriages for 10-inch guns and estimates have been made for disappearing carriages for 10-inch guns. The arsenal is now equipped for producing large castings, such as the platform plates used for mounting guns at the proving ground at Sandy Hook and other special massive castings requiring high tensile strength. The output from the arsenal of sea coast guns of regulation pattern during the year was 11 8 inch, 11 10 inch and six 12 inch. In addition, one 10 inch wire wound Crozier gun has been completed and work is in progress on seven 12 inch mortars. With the additional machinery already installed the output per annum will be, as anticipated, 12 8 inch, 15 10 inch and 15 12-inch guns.

The Census Bureau has lately promulgated a bulletin on the manufactures of the United States, which contains some very interesting information as to their condition at the late census. The document gives statistics of 67 industries, each turning out a yearly product of \$30,000,000 or over, included in which are the iron and steel, cotton, wool, lumber, oil, leather, flour and grain, and other leading industries. Of these 67 industries 287,501 establishments reported, or 80.89 per cent. of the total number in the United States. These establishments represent an aggregate invested capital of \$5,249,139,842, or 45 per cent. of the total capital for all kinds of industries. In them are employed 3,730,557 persons, receiving \$1,811,186,882 in wages, or 79.17 per cent. of the employees and 79.34 per cent. of the wages of all industries. The cost of materials used was \$4,273,402,066, or 82.84 per cent. of the total cost of materials for all industries. The value of product is shown as \$7,618,836,200, or 81.31 per cent. of the total of all manufactured products in the United States in 1890.

The plethora of money continues unabated. Saturday's statement of the New York banks showed, however, an increase in loans to the extent of \$1,129,300, but deposits at the same time increased \$309,700. The banks now hold \$63,204,275 surplus reserve over the legal requirement; and, notwithstanding the recent action of the banks in reducing interest on out-of-town deposits, the flow of money from the interior appears to be unchecked.

The coal tests to be made by the "Montgomery" at Pensacola are exciting interest among the large producers here. The conditions that not less than 100 tons are acceptable for trial shut out the smaller mines. The Sloss Iron & Steel Company, Tennessee Coal, Iron & Railway Company and the Standard Coal Company have so far expressed their determination to send coal for trial and the results are looked forward to with great interest.

## The Iron & Metal Trades.

As the result of the elections, an improvement in business is expected by the majority of those who control large industrial operations. That feeling alone may go far toward bringing it about. In calmer mood the somewhat extravagant predictions now current may be withdrawn. But there is very good foundation for the hope of better times to come.

All doubt is now removed concerning any unwise legislation on the currency question, a fact which will tell a good deal with the timid holders of idle money. Then there is the further assurance that there will be no further hostile action on the tariff for a long time to come. With these perplexing questions out of the way capital may begin to look about for a chance to earn good interest instead of being chiefly concerned with the safety of the principal.

Many meritorious schemes have been lying dormant since the panic. The time seems to be approaching when some of them may be taken up. We heard lately of instances in which projects have had a hearing, which is a good deal more than was granted a month or two ago. It is clear that confidence is growing slowly, and it is the most important fruit of the elections that that process may be quickened in the near future.

One feature in the situation in the Iron trade proper deserves more consideration than has yet been given to it. It is a remarkable fact that in the area of production of cheap Pig Iron from Lake Ores and Connellsville Coke the capacity is practically fully employed. In the whole districts embracing Buffalo, the Shenango Valley, the Conemaugh, Pittsburgh, the Mahoning Valley, Cleveland, Wheeling and the Ohio River there are very few modern furnaces out of blast. On October 1, these districts were making with 72 furnaces close to 86,000 tons of Iron per week. On November 1 they were turning out close to 89,000 tons per week. All of the furnaces out of blast in that whole great region could not, at present prices, add 5000 tons a week more than that total.

The only reserve of really modern plant located to assemble materials to advantage and produce at low cost is to be found in the Chicago district.

This means that if there is any quickening in the demand, notably for Bessemer Pig, it cannot be supplied by those producers who are making Iron at low cost. It is a well-known fact that even now demand and supply in the markets referred to are very closely balanced. While it is possible that the consumption may soon fall off, with the approach of the usual midwinter dullness, it is a fact that should be carefully kept in mind that what might be termed the area of low cost is being drawn upon close up to its maximum capacity.

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago, November 7, 1894.

The past week has been decidedly quiet in all lines. Much of this is attributed to the election excitement. Numerous cases are reported in which important deals are pending that have been postponed until the latter part of this week or the week following. It is expected that trade will be considerably better during the remainder of the month.

**Pig Iron.**—Dealers unite in reporting a very moderate volume of business. Inquiries are good, however, and trade is by no means ended for the fall season. Excellent orders are in prospect in local Coke Iron which will be closed within the coming ten days. Some Southern sales have recently been made here in sufficient quantities to indicate that a reasonable amount of business may still be expected in this locality by Southern makers. Prices on Southern Iron have been reduced with a view to increasing the trade in this class of Iron. Lake Superior Charcoal continues quiet. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$13.00 @ \$15.00
Local Coke Foundry, No. 1.....	10.25 @ \$11.00
Local Coke Foundry, No. 2.....	10.00 @ \$10.25
Local Coke Foundry, No. 3.....	9.50 @ \$10.00
Local Scotch.....	10.25 @ \$11.00
Ohio Strong Sorterens No. 1.....	13.00 @ \$13.50
Southern Silvery, No. 1.....	11.50 @ \$11.75
Southern Silvery, No. 2.....	11.25 @ \$11.50
Southern Coke, No. 2.....	10.25 @ \$10.50
Southern Coke, No. 3.....	9.75 @ \$10.25
Southern, No. 1, Soft.....	10.25 @ \$10.50
Southern, No. 2, Soft.....	9.75 @ \$10.25
Alabama Car Wheel.....	17.50 @ \$18.00
Jackson County Silvery.....	15.50 @ \$16.00
Other Ohio Silvery.....	14.25 @ \$14.50
Coke Bessemer.....	11.25 @ \$11.50
Coke Malleable.....	10.50 @ \$11.25
Spiegeleisen 20%.....	... @ \$26.00

**Bars.**—Transactions have increased but the volume of business is still below what it should be at this time of the year. Very small orders are the object of severe competition by all manufacturers doing business in this locality. Quotations on mill shipments of Common Iron are continued at 1.02½ @ 1.05¢, Chicago, but these rates are shaded. On good specifications guaranteed Iron is steady at 1.15¢ @ 1.20¢, and Soft Steel Bars from strictly Billet stock are unchanged at 1.20¢ @ 1.25¢. Jobbers are selling small lots at 1.15¢ upward for Iron, and 1.25¢ upward for Soft Steel.

**Structural Material.**—The three bridge contracts on the drainage canal have not yet been placed, although bids were opened last week. Small lots of Bridge Material and Building Shapes are in fair demand, but nothing large is now immediately in sight. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.90¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

**Plates.**—Dealers appear to have been more favored than manufacturers' agents in the business taken recently. The former report good orders for both mill shipments and from stock. We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.40¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75% off.

**Sheets.**—Manufacturers of Black Sheets are catching up to their orders, and are now soliciting business with a little more vigor. Prices are unchanged, mill shipments of No. 27 Common Iron for early delivery being quoted at 2.35¢ @ 2.40¢, Chicago; Steel Sheets, 2.45¢ @ 2.50¢. The situation is unsatisfactory in Galvanized sheets, prices being weak under competition from some of the less known mills. The standard brands are being held up fairly well at 75 and 10 and 5% @ 75 and 15%. Sheet Copper stands at 14¢ base. Small lots of No. 27 Common Black Sheets from stock are quoted at 2.40¢ @ 2.50¢, and Galvanized Sheets, 75 and 10% off.

**Merchant Steel.**—A fair business was placed during the early part of the week, but matters became very quiet toward the close. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Bessemer Machinery, 1.40¢ @ 1.45¢; Bessemer Tire, 1.40¢ @ 1.45¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

**Billets and Rods.**—The situation is unchanged, the local mills being extremely busy and no open quotations are being made.

**Rails and Track Supplies.**—The end of the season is near at hand and the railroads in this vicinity have apparently taken all the Steel Rails they will need for this year. Some orders are in sight from the Southwest, and it is expected that enough business will be secured from that locality, together with orders now on the books, to keep the local works employed well into the month of December. No orders have come up for next year. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.25¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.65¢ @ 1.75¢; Links and Pins, 1.65¢ @ 1.70¢.

**Old Rails and Car Wheels.**—Railroads are soliciting offers on their stocks of Old Iron Rails. Consumers hesitate to bid even \$10.50. Old Steel Rails are now quoted somewhat lower at \$7 for short pieces and \$10 for long lengths, Pittsburgh. Consumers are now drawing very little from this market; a sale 1500 tons of Old Car Wheels is reported at an outside point. Dealers here are doing very little and bid \$9.50, while holders ask \$10.

**Scrap.**—Trade has been inclined to quietness the past week and very little has been done to indicate whether values have changed or not. Dealers quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8.50; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$13; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.50; Wrought Turnings, \$5.50; Axle Turnings, \$6.25; Fish Plates, \$9.50 @ \$10; Horseshoes, \$9.25; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$7 @ \$7.50.

**Metals.**—Lake Copper is quoted at 10¢ in carload lots. Casting Copper is very quiet, with quotations unchanged at 9½¢ @ 9¾¢ according to brand and quantity, but prices are weak. Spelter has been sold in single carload lots at 3.25¢. Pig Lead is dull but remarkably firm at 2.95¢ per spot.

**Later.**—Two thousand tons Wire Rods sold to Western consumer at

something under \$24; 2000 tons heavy Melting Steel Scrap sold at \$7.50.

After 17 years of continuous active service in the management of the Chicago branch of the Washburn & Moen Mfg. Company, H. B. Cragin now retires, having accepted an important position in connection with the barb wire interests of the country. The Chicago office was established by him and its present importance is largely due to his efforts. He has been succeeded by C. T. Boynton, who has been manager of the company's new mill at Waukegan, Ill., since it was started three years ago. Mr. Boynton was for many years connected with the Chicago office, and when the new works were erected was placed in charge. His promotion to the management of all the company's business in Chicago and Waukegan is an appropriate recognition of his able administration of the large interests which have been under his care.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }  
PITTSBURGH, November 8, 1894.

Almost the entire attention of the trade is diverted to the elections, and business for the time being is put aside. Under these conditions it is hardly necessary to state that the week has been a very quiet one and transactions few. Prices show little change, with the exception of Bessemer Pig, which is weaker. Steel is holding its own and in some sections views of makers have stiffened up. Finished material is in fair request at unchanged prices. Talk is going of another Coke strike, and November 15 is the date given on which the men are to go out, but little attention is given to the report. It is the general belief that it is being sprung in order to affect the Pig Iron market. As we get closer to the end of the year the belief increases that 1895 will be ahead of 1894 in volume of business, but not so much faith is attached to betterment in prices early in the coming year.

**Pig Iron.**—The tremendous production of Pig Iron during the past two or three months is beginning to tell and several Valley furnaces are piling Iron. It is understood that this is being done in preference to forcing their Iron on the market and thus pushing values down, and also for the reason that some furnace men believe that prices of Pig about the first of the year will be better than they are now. The demand for Bessemer Iron is very light just now and prices have sagged downward during the week. The market on Gray Forge is quiet, but prices are unchanged on the basis of \$9.75, Pittsburgh. Reports are going that \$9 at Valley furnace, equal to \$9.65, Pittsburgh, has been done on Gray Forge. A slightly better demand is noted for Foundry Iron, due to the fact that work among the foundries is a little more plentiful. We quote the market as follows:

Neutral Gray Forge.....	\$9.75 @ \$9.90 Cash.
All-Ore Mill.....	9.75 @ 10.00 "
No. 1 Foundry.....	11.65 @ 11.75 "
No. 2 Foundry.....	10.75 @ 11.00 "
Bessemer.....	10.75 @ 10.90 "

We note a sale of 3000 tons of Bessemer for November and December at \$10.75, Pittsburgh; also 300 tons of Gray Forge at \$9.75, Pittsburgh, and a sale of 100 tons of No. 2 Foundry at \$10.75, Pittsburgh.

**Ferromanganese.**—We quote at \$50 for 80% domestic. It is probable this

price would be shaded, however, for a firm offer, as foreign has been laid down here at less than the above price.

**Billets.**—There is a fair demand for Steel, but for small lots only. Considerable Steel for Eastern delivery has been sold within the last month, but most of it is from districts outside of Pittsburgh. The Wheeling mills are reported as being firmer in their views on Steel and some low quotations have been withdrawn. Pittsburgh mills continue to ask \$15.75 @ \$16 and are refusing to shade our lower quotation. A local mill has rearranged its wage scale and some reductions in wages of tonnage men have been made.

**Structural Material.**—The demand has fallen off considerably and a local mill has gone on five days a week, said to be due to lack of orders. The only order of importance given out for some time was one for some 3000 tons of Beams for New York City, taken by a local mill at a low price. We quote as follows: Beams and Channels up to 15-inch at 1.25¢ @ 1.35¢; Angles and Universal Plates, 1.15¢ @ 1.20¢, Tees at 1.35¢ @ \$1.40¢.

**Plates.**—The volume of trade is fair, but is for small lots only. Some mills that have considerable work on their books are declining to meet the lowest prices. We quote as follows: Tank Steel at 1.20¢ @ 1.30¢; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢. For a very desirable order our lower quotation on Tank Steel might be shaded about \$1 per ton.

**Muck Bars.**—We make nominal quotations of \$18.75 @ \$19 for best grades, delivered at buyer's mill. There is nothing doing.

**Bars.**—Some mills report a slightly better inquiry. It seems certain that any change to come must be for the better, as the condition of the Bar Iron market could hardly get worse. The readjustment of West bound freight rates, which carries slight advances to some points, to go into effect on December 1, is hastening shipments. While prices are not higher they are firmer, and some mills are refusing to meet the very lowest prices. We quote Common Iron Bars at 0.95¢ @ 1¢ and Soft Steel Bars at 1¢ @ 1.05¢, with the usual extras.

**Sheets.**—The demand for Black Sheets is not as urgent as it was, but for prompt shipments mills are still able to get very close to prices ruling when the demand was at its best. Buyers who are in position to contract now for deliveries in the next two or three months would have concessions offered. We quote No. 27 Common Iron, for prompt delivery, at 2.20¢ and No. 27 Steel at 2.30¢; Galvanized Sheets are slightly lower in price, the demand having fallen off to some extent and mills are more eager for business. We quote at 75 and 15% @ 75 and 10 and 5% for standard brands.

**Merchant Steel.**—The situation is slightly improved, there being a little better demand, and specifications are coming better than for some time past. Prices show no decided change, and we continue former quotations, as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.50¢ @ 1.60¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢.

**Wire Rods.**—There is nothing doing, and several of the local mills are shut down temporarily until there is an improvement in the demand. We make nominal quotation of \$22.25 @ \$22.50, at maker's mill.

**Skelp Iron and Steel.**—The demand is moderate and prices are unchanged. We quote as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to size; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.20¢ @ 1.25¢; Sheared Iron Skelp, 1.30¢ @ 1.35¢.

**Pipes and Tubes.**—Business is light and some low prices are being made in Boiler Tubes and Pipe. A local mill is credited with taking quite a large order for Boiler Tubes for Eastern shipment at an exceptionally low price.

**Barb Wire.**—The volume of business offering for shipment this year is light, but some large orders have been placed for delivery next year. We quote Four-Point Galvanized at \$1.95 @ \$2.05 at mill. We quote Plain Wire at \$1.20 @ \$1.25 in carload lots at maker's mill.

**Wire Nails.**—An improved demand is noted, and prices are more settled than they have been for some time past. Some heavy sales of Wire Nails for delivery next year have been made. We quote Wire Nails at 95¢ @ \$1.05, according to quantity. Cut Nails may be quoted at 90¢ at mill for usual averages.

**Connellsville Coke.**—For the first time in some weeks production and number of active ovens show an increase. For the week ending Saturday, October 27, there were 14,354 ovens active and 3220 idle, the production for the week in question being estimated at 141,826 tons. Compared with the production of the previous week this was an increase of 2816 tons. In the active list of ovens there was a net gain of 31. We continue to quote Furnace Coke at \$1 and Foundry Coke at \$1.15 per ton to consumers. Furnace Coke for balance of the year has been sold as low as 90¢ per ton, but this price would not be accepted for delivery after the first of the year. Reports are going of another strike in the Connellsville region to be inaugurated on November 15, but they are generally discredited.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., }  
PHILADELPHIA, Pa., November 8, 1894.

On the eve of an exciting election, such as the one now in progress, it seems useless to attempt to write anything in regard to the market for Iron and Steel, except to say that up to this time there has been no change from last week. As regards the prospects apart from the political situation, it cannot be said that they are good. In some lines business is fair, in others it is less active than it was earlier in the season. There is a vast amount of business that ought to be done, and would be done if money was in hand to carry it through. Money is abundant enough, it is true, but those who would buy Rails and cars and locomotives, and those who need them most, have the least money to go to market with. This will be overcome in time, but it will need time, as bankers will require just as full security after the elections as they do before. The point we wish to make is that it will take time to turn around, and while the outlook will be immensely improved by the Republican victory, it will be a mis-

take to suppose that big orders will be rushed into market forthwith. Preparatory work will commence, but the harvest will be later on. There is yet a large amount of unemployed capacity, and until that is in operation with a fair backing of orders, it will be futile to expect any but a very modest appreciation in values. Meanwhile last week's quotations stand good to-day, although it is hoped that next week we may be able to say "firmer with a more active demand."

Mr. Robert M. Cunliffe has purchased the interest of his deceased partner, Adolph Bussenius, and will continue the business at the old stand, 1142 Washington avenue, Philadelphia, as dealer in Scrap Iron and Old Metals of all descriptions.

### St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis, November 7, 1894.

**Pig Iron.**—Since our last report sales have not increased very materially. There are a number of inquiries in the market which if they result in sales will make a good showing. Consumers state that they are able to shade the market and do not feel that the time for heavy buying has as yet arrived, and continue to buy as their actual requirements demand. There is a gradual increase in the demand from all quarters, and while there is no great improvement anticipated until after the turn of the year a fairly satisfactory business seems assured for the next two months. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foun-	
dry.....	\$10.75 @ \$11.00
Southern Coke, No. 2 Foun-	
dry.....	9.75 @ 10.00
Southern Coke, No. 3 Foun-	
dry.....	9.50 @ 9.75
Southern Car Wheel.....	16.50 @ 17.00
Gray Forge.....	9.00 @ 9.25
Ohio Softeners.....	14.00 @ 14.50

**Bar Iron.**—The demand for Bar Iron shows some improvement. Prices have also taken a slight upward turn and 1¢ @ 1.05¢ is now quoted, the latter figures prevailing in most of the transactions recorded. Car manufacturers are better employed and are buying more liberally in consequence.

**Bar Wire.**—There is no change to note in this department. As is expected at this season the demand is only fair, while prices remain unchanged. Painted is quoted in carload lots at \$1.65 @ \$1.75; Galvanized, 40¢ per hundred weight additional.

**Wire Nails.**—Notwithstanding the agreement entered into by the Nail manufacturers to regulate the price of Nails there continues to be sufficient quantities offered to keep the price hovering around \$1 per keg. Jobbers are selling only moderate quantities and quote \$1.10 @ \$1.15.

**Rails and Track Supplies.**—The railroad buying noted in our last report continues. In the way of Rails several sales of light sections are reported, with a number of inquiries now in process of being closed. Track Supplies are quoted as follows: Splice Bars, 1.15¢ @ 1.20; Spikes, 1.60¢ @ 1.65; Bolts, Square Nuts, 1.80¢; with Hexagon Nuts, 1.90¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Steel Rails, \$26.50 @ \$27; Old Iron Rails, \$11 @ \$11.25.

**Pig Lead.**—The prices have not varied very much during the last week.

Sales have been made at from 2.95¢ to 3¢ and sellers are asking the latter figure at the close to day.

**Spelter.**—Sales of Spelter have been largely confined to carload lots, which have been taken at 3.20¢. There is no disposition among consumers to anticipate their wants, so the demand is largely of a hand to mouth character.

### Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,  
CINCINNATI. November 7, 1894.

There has been only a jobbing demand for Pig Iron during the week, and it was scattered through this district, the North and to a very moderate extent the East. There have been bids made at lower prices for larger quantities, although not for any very large lot, and yet these bids were declined by the Southern furnaces, for they assert that prices are down to rock bottom now, and that any change must be to higher rates, for the condition of labor in the South makes this imperative, and there are some buyers who assert that the market is weak. That it is quiet all admit, but there is no disposition apparent to accept lower prices. There is much complaint that cars in the South are so generally required for moving cotton that the movements of Pig Iron are restricted, but there is no urging to ship Pig Iron in this direction. There is no new factor in the consumptive side of the market, and dullness is the prominent feature all around. Quotations are as follows:

#### Foundry.

Southern Coke, No. 1.....	\$10.00 @ \$10.25
Southern Coke, No. 2.....	9.50 @ 9.75
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1.....	14.50 @ 15.00
Ohio Soft Stone Coal, No. 2.....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.00 @ 12.50
Lake Superior Coke, No. 2.....	11.00 @ 11.50
Hanging Rock Charcoal, No. 1.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 2.....	15.50 @ 16.00
Tennessee Charcoal, No. 1.....	18.00 @ 18.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	15.75 @ 16.75
Lake Superior Car Wheel and Malleable.....	14.25 @ 14.75
Forge.....	
Gray Forge.....	8.50 @ 8.75

Mottled Coke.....	8.25 @ 8.50
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### Metal Market.

**Pig Tin.**—Immediately after the date of our last report prices for Straits Tin were forced up to about 14.90¢ @ 14.95¢, net cash, prompt and future delivery. Since then a reaction to 14.70¢ @ 14.75¢ has taken place. Several hundred tons changed hands in the meantime, the bulk of it in the nature of closing out old deals. Further than the movement in prices and the speculative deals there is nothing to report.

Jobbers and consumers have purchased very conservatively and seem to be bothered little by the ups and downs of the speculative market, since with the strongest complexion put upon the statistical position it is found that there is not only enough Tin to go around, but some to spare. In fact, the visible supply is still abnormally large and the records indicate that the deliveries latterly have swelled the "invisible" supply in no small degree. At the close of the week the market was unsettled, with 14.60¢ @ 14.65¢ apparently all that could be realized for round lots on net cash terms. Jobbing parcels were dealt out at 14.75¢ @ 14.85¢, usual store terms.

**Copper.**—The market remains in *status quo*. There has been little or nothing more than routine business, and that was mainly of the most commonplace type, rarely involving more than small lots for early delivery. This class of orders has been filled at about former prices, namely, 9.55¢ for Lake Superior Ingots, 9.40¢ for Electrolytic, and 9.20¢ @ 9.30¢ for ordinary casting stock. Nothing tangible comes out regarding deals involving round lots for delivery next year, and there is remarkable silence about the progress of negotiations to govern or restrict production. The one suggestive feature is that there seems to be enough Copper to go around.

**Pig Lead.**—There is perhaps a shade better tone to the market, but business here has been of moderate proportions and the demand only fair. The firmness would seem to be due chiefly to Western business that amounted to considerable in the aggregate. About 3.12¢ here is apparently bottom price for prompt or early shipments.

**Spelter.**—Business has been fair and the demand is somewhat better, making, upon the whole, quite a firm market. It is doubtful if other than inferior brands can be purchased at less than 3.40¢, delivered, here or at other Eastern points; 3.45¢ is generally asked for popular brands and some sales have been made at that rate.

**Antimony.**—There has been some improvement in sales, but prices are still rather soft, with 8½¢ quoted for Cookson's and 7½¢ @ 7¾¢ for Hallett's.

**Tin Plate.**—Dealing have been on a moderate scale and the individual purchases almost invariably are on extremely conservative lines. The supply here has increased and the assortment is more liberal. Prices are barely steady with the following quoted for spot stock: Charcoal Tins: Melyn Grade, one-half X IC, \$5; IX, \$6.50; Lisvane, &c., IC, \$4.30; IX, \$5.25; Allaway Grade, \$4.25; IX, \$5.05; Siemens Steel, IC squares, &c., full weight, \$4 37½ basis; 100 lb, \$4.10 basis. Bessemer Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.12½; 100 lb, \$3.77½; 95 lb, \$3.67½; 90 lb, \$3.57½. Charcoal Tins: M. F., IC 14 x 20. \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.75; IC 20 x 28, \$8.60; Alyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8.05; Alyn, 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7.60; D. S. & Son, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3.90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.85.

**Stock Warrants.**—The American Pig Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard September 30, 1894.....	102,800
Put in yard for 31 days, ending October 31, 1894.....	700
Total.....	103,500
Withdrawn 31 days, ending October 31, 1894.....	2,800
Net stock in yard October 31, 1894.....	100,700

It is estimated that wheat will be used as food for farm animals on one-fifth of the farms in the United States this winter. The *St. Louis Chronicle*, which gives this estimate, is of the opinion that not less than 150,000,000 bushels will be thus utilized this season.

## British Metal Market.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, November 7, 1894.

Pig Tin was firmer early in the week under the influence of free buying prompted by moderate shipments from the Straits last month and slight decrease in spot stocks. Subsequently a reaction took place owing to the cessation of syndicate support and pressure to sell three months' futures. Prompts were sold at as low as £66. 10/, but recovered on large purchases to cover short accounts. To-day the market was steadier, with prices at £66. 15/ for prompts and £67. 2/6 @ £67. 5/ for three months' futures.

Copper weakened to £40. 2/6 for Merchant Bars, prompt delivery, and the market has been dull. Tired holders unloaded when opportunity was offered. Buyers have been reserved, owing to disappointing statistics, continued large arrivals of American and rumors that Lake Superior producers are again quietly selling to consumers at low prices. Large sales of Rio Tinto reported here and quantity of Ingots sold for Continent account. Late dealings in Merchant Bars were at £40 for prompts and £40. 10/ for three months' futures. Best selected English quoted at £43. 10/@ £43. 15/.

Tin Plate has been dull, and prices still show a declining tendency. A fair business was done at intervals, when makers met buyers' views. Cokes and Charcoals are nominally 3 pence lower. Ternes are about 6 pence down. Light weights continue to be in relatively best demand. Makers propose reducing workmen's wages 25%. Unless a concession is made several works will probably close down. The Avondale works restarted this week. Swansea quotations are as follows:

Bessemer Cokes, IC.....	9/8 @ 10/
Siemens Cokes, IC.....	10/ @ 10/3
J. B. Steel Cokes, IC.....	9/9 @ 10/
Dean Ternes, 20 x 28 .....	18/ @ 20/
Charcoals, IC.....	11/ up.

Exports last month were 41,000 tons, against 27,000 tons last year. The quantity shipped to the United States was 24,000 tons and 13,000 tons respectively. Stocks at Swansea now about 280,000 boxes.

Pig Lead is quiet and prices are at £9. 15/ @ £9. 17/6 for Soft Spanish.

Spelter has dropped to £14. 17/6 @ £15 for ordinary Silesian, and is selling slowly.

Pig Iron warrants have averaged somewhat higher in price, but speculation is tardy throughout. Late dealings were at 42/7 @ 42/3 for Scotch, 35/7/4 @ 35/9 for Cleveland and 43/9 for Hematite. Exports of Pig Iron last month aggregated 89,000 tons, against 78,000 tons in October 1893.

Joseph T. Mason has been appointed sales agent of the Reading Rolling Mill Company, Reading, Pa., makers of

Shapes, &c., for New York City and vicinity. Mr. Mason's office is at 29 Broadway.

## Louisville.

LOUISVILLE, KY., November 5, 1894.

General business is very satisfactory, the present volume being equal to that of ordinary years; especially is this the case in Iron and hardware lines. Of course the low range of prices prevents some people making as much money as they are accustomed to do, and it is claimed that the consumer gets this benefit, but most classes of consumers are producers of something else, and their products are likewise affected, as witness the farmer and price of wheat, the lumbermen and prices of lumber to-day, particularly Southern pine. Collections are good, merchants having all the cash they need, and the banks report money easy, yet they are able to keep all surplus well engaged.

The manufacture of one of Kentucky's great products, whisky, will begin between now and January 1, and the builders of certain lines of machinery and copperwork will have plenty to do. Owing to new custom laws extending the bonding period many new warehouses and other buildings will be projected. The Hoop Iron business will also have occasion to boom.

**Pig Iron.**—The condition of trade is in favor of the buyer. Low as prices are some concessions could be obtained if a few large orders should come into the market. Some furnaces are inclined to make a stand and not push sales, being in a position to wait for later lines, which they expect about the first of the year. The only grades of Southern Iron in active demand are Silver Grays. The demand for this abnormal product is so much in excess of supply that few stove foundries can afford or even obtain it. Actual prices are about as follows:

Southern Coke, No. 1 Foundry.....	\$10.00
Southern Coke, No. 2 Foundry.....	9.25
Southern Coke, No. 3 Foundry.....	8.75
Southern Coke, Gray Forge.....	8.25
Southern Coke, Mottled.....	8.00
Southern Coke, No. 2 Soft.....	8.75

**Bar Iron.**—Small orders only are placed, except in cases of car companies. Dealers seem more inclined to let the mills carry stocks. The same conditions prevail with Sheet Iron consumers. Prices on Common Bar 1.05¢ @ 1.10¢, delivered here in carloads. Refined Bar 2¢, 3¢, 4¢ \$ lb, according to qualifications; Charcoal Bloom Boiler Plates, 5¢ \$ lb; Steel Boiler Plates, 1.60¢ @ 2.25¢ \$ lb; Steel Tank Plates 1.40¢ \$ lb. The demand for Pipe is fair, with plentiful supply. Wire Nails have enjoyed a good fall trade, and considering the regular downward course of prices, it is hard to see where the jobbers can come out even. Mills are now quoting to big buyers 90¢, f.o.b., carload lots, for good average. Great disappointment has been experienced by both mills and jobbers in regard to Barb Wire. Stocks bought at low prices remain unsold, and low prices seem to have no effect in stimulating prices. The Bolt factories are full of orders and actually have the temerity to meet together and resolve on higher prices; 85 and 10% on Common Carriage and 85, 25 and 5% on Machine Bolts represent the average prices asked by the mills, usual freight allowance.

Exports from the United States in October fell off 16%, as compared with last year, while imports were 9% greater.

## Financial.

The occurrence of an exciting election has served to make the week under review an exceedingly dull one in financial and business circles generally. On the Stock Exchange the market was comparatively stagnant and somewhat weak up to the close of last week, owing in part to the reason above referred to, and partly to the unsatisfactory condition of the anthracite coal interests and to unfavorable reports of net earnings on several of the granger roads. The market on Monday, however, while extremely narrow showed a firmer tone with a slight gain in prices, owing to a considerable covering of short interests.

Many persons are confidently looking for a rise in prices with a revived investment business in stocks as a result of the elections. The Republican successes, they argue, will mean increased confidence and more buying of securities, as well as a stimulated movement in all lines of trade. With this should go hand in hand a better demand for money and a consequent improvement in the general financial condition, especially in this and other mercantile centers.

The coal road stocks are still heavy, owing to the unsettled condition of the anthracite mining interests. New Jersey Central having been a special object of attack, yielded some 6½ points, and is down to 91½. Lackawanna and Delaware & Hudson have barely held their own in the last few days, while Reading is a trifle stronger. The Granger stocks, although inactive, have developed considerable strength, a fact which was evident in the fractional advance in St. Paul and Rock Island, which took place on Saturday in the face of unfavorable traffic returns from both those roads. The decrease in St. Paul's earnings for the fourth week in October was \$295,634, and the falling off in gross earnings of Rock Island for the month of October was \$526,143. These showings are not, however, so very unfavorable when it is considered that the comparison is made with a time of last year when World's Fair earnings were large.

The general bond market has exhibited a distinct improvement both in the volume of business transacted and in the prices realized. Home demand for these securities for investment purposes has been large, causing a marked strength in the market and an advance in prices all along the line. Atchison and Northern Pacific issues advanced sharply on large dealings. One reason given for the demand for bonds at the present time is the fact that some of the larger Stock Exchange firms have followed the example of the banks and notified their clients that they can no longer pay interest on the balances left in their hands for which they are unable to find profitable employment. These clients, rather than have their money lying idle, have been purchasing bonds. Foreign houses also report a decided increase in European buying of American bonds, some of which have been shipped, and it is expected that a larger amount will go this week. First-class issues of bonds are scarce.

The Howard Harrison Pipe Works, at Bessemer, are planning extensive improvements and calling for bids for 100 coke ovens with gas saving attachments, which gas they expect to utilize under their boilers and for heating core ovens.

# HARDWARE.

## Condition of Trade.

THE ATTENTION GIVEN to political matters during the past few weeks probably interfered somewhat with the volume of business, which, notwithstanding, continues fair though not heavy. The steady, and in the aggregate large, consumption of goods which is constantly going on calls for frequent replenishing of stocks, but merchants are very careful not to buy in excess of their immediate requirements. The year has shown a marked decline in the prices of so many goods and the market is still in so irregular and unsettled a state that they are not disposed to purchase Hardware which they may be called upon to carry until it can be replaced at lower figures. The near approach of the annual inventory also deters them from adding unnecessarily to their stock. A fair proportion of current business is for holiday and winter goods, but miscellaneous and heavy Hardware is also receiving its share of attention. In view of the result of the election an increase of confidence and an improvement in the tone of the market is anticipated.

### Chicago.

(By Telegraph.)

The Shelf Hardware trade is in reasonably good condition. The demand is as large as could be expected under the conditions which have been prevailing this year. The volume of business is much beyond that of last year at this time, although it is still considerably behind that of 1892. The month thus far shows indications of keeping up to the volume of business in October. Some jobbers are in receipt of good orders for seasonable goods, such as Stove Boards, Coal Hods and Stove Furniture, but others report that the very mild weather recently prevailing has considerably interfered with their trade in articles of this character. A cold snap is ardently desired, as it is expected to greatly increase the movement in this line. The demand for Tinware and House Furnishing Goods has expanded remarkably during the past two weeks. Factories are still in arrears on shipments. Orders are of the same character as heretofore, being made up almost entirely of broken packages, but they make up in number what they lack in size. Manufacturers of Aluminum Ware report a steadily augmented trade. Sidney Shepard & Co. are greatly pleased with the success attending their new departure in this line. Heavy Hardware is quiet.

### St. Louis.

(By Telegraph.)

The volume of business continues in the satisfactory condition last noted, and it is pleasant to note that orders are increasing in volume as well as in number. New stocks continue to be sold with considerable regularity. Seasonable weather set in a few days since and the entire trade has felt the effect. Orders for winter goods are coming in with a rush and the local jobbers all have their hands full to ship promptly. The shutting down of the tin plate mills throughout the country has caused a scramble for supplies and jobbers are at their wits' ends to keep their stocks in anything like complete shape. Galvanized iron is also a heavy seller just now. Staples like Barb Wire, Wire and Cut Nails, &c., fail to show any improvement either in price or demand. Builders' Hardware continues to be a leading seller, and the past three months will show that in this line the demand has run far ahead of general expectations. The Bicycle manufacturers are busy making preparations for next year, and as the leading maker of wheels has reduced his price to \$100, it is expected that other makers will make similar cuts. The business is in such shape, however, that no demoralization of prices is anticipated.

## Notes on Prices.

**Wire Nails.**—There is little reason for complaint in regard to the volume of business, and some large orders and many smaller ones have been placed with manufacturers during the past week or two. In the matter of prices there is little new to be reported. Ninety-five cents, f.o.b. at mill, for carload lots, is a general price, but it is frequently slightly shaded, and the price of 90 cents is being made on attractive orders.

**Chicago, by Telegraph.**—Manufacturers' agents report an improved volume of business. Inquiries are much larger and sales have been decidedly better. Orders are particularly good from localities which can be reached by water, but buyers from other sections are also taking more than for some little time. Factory prices are still irregular. The leading houses continue to quote for Western business on the basis of \$1.10, Chicago, but these rates are being shaded to meet special circumstances. Jobbers quote small lots from stock at \$1.10.

**Cut Nails.**—The Cut Nail market is without important change, prices being

on the basis of 90 cents for carload lots on dock, New York, with a 60-cent average. Small lots from store in New York are quoted at \$1 to \$1.05. The demand is fair and the tone of the market pretty steady.

**Chicago, by Telegraph.**—The demand on manufacturers is still confined to carload lots, but they are received in sufficient number to keep the local works well employed. Outside manufacturers have recently made some efforts to take part of the trade in this locality, but owing to the fact that they seek orders for 1000-keg lots or more they have been unsuccessful. Factory prices are unchanged at 90 cents, Chicago, on 60-cent average. Jobbers continue to quote small lots at \$1 from stock.

**Barb Wire.**—The Barb Wire market is quiet, with few inquiries for immediate delivery. There is more or less negotiation going on in regard to orders for next season. The market is represented by the following quotations on Four-Point Galvanized in carload lots, at the points named : Pittsburgh, \$1.95 to \$2 ; Cleveland, \$2 to \$2.05 ; Cincinnati, Allentown, Chicago and New York, \$2.10 to \$2.15.

**Chicago, by Telegraph.**—Business is quiet both with respect to orders for spring shipment and for fall delivery. Less effort is being made now to book orders for spring delivery by offering favorable terms of shipment. Manufacturers are evidently of the opinion that they will be able to control the trade more closely than in the past and appear disposed to wait for business in the natural way. Manufacturers and jobbers alike report light sales. Small lots of Galvanized continue to be quoted at \$2.25 from stock and \$2.15 from factory. The Plain Wire trade is much better than that in Barb Wire. Manufacturing consumers are buying quite freely.

**Glass.**—The condition of the American Window Glass market shows little improvement since our report of last week, and quotations, it is reported, have been made which appear unnecessarily low. It is understood that prices have been made in the West at less than 90 per cent. discount for both single and double strength Glass in large lots. Such cases are probably the exception rather than the rule, as Pittsburgh and Eastern manufacturers, it is believed, are less ready to make concessions on quoted prices than they have been in the past. Although it is difficult to detect an improvement in this direction it is believed that

prices, on an average over the country, are firmer, and that an improvement may be looked for.

**Iron Rivets.**—The American Screw Company, Atlas Tack Corporation and other manufacturers of Iron Rivets have adopted a revised list under date November 1, which is given in full in the following columns. It will be observed that there are a number of changes in list prices. The discounts announced by the manufacturers are as follows: Sixty-five per cent. on Norway Iron Rivets, and 75 per cent. on Soft Steel or second quality Rivets. The American Screw Company issue a discount sheet under date November 1, in which they quote Rivets under the new list as follows:

Norway Rivets:	Per cent.
Ordinary, in bulk .....	65
Coopers' .....	65
Thousand, " .....	65
Thousand, in papers .....	65
Block and Carriage, in papers of 100 .....	65
Hame.....	65
Belt, with burrs .....	65
Bay State Rivets.....	75

The discount sheet also gives quotations on their complete line of goods, including changes on Tire and Sleigh Shoe Bolts recently made.

#### Iron Rivets in Bulk.

Price Per Pound.

#### Length of Rivets.

Size.	$\frac{1}{8}$	$\frac{15}{32}$	$\frac{7}{16}$	$\frac{19}{32}$	$\frac{9}{16}$	$\frac{11}{32}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{1}{4}$	$\frac{7}{32}$	$\frac{9}{16}$	$\frac{5}{32}$	$\frac{1}{8}$	$\frac{3}{32}$
$\frac{7}{32}$	\$0.15	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16
$\frac{11}{32}$	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
$\frac{6}{32}$	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
$\frac{1}{16}$	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
2	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
3	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
$\frac{1}{4}$	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
4	.15	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
5	.16	.17	.17	.17	.17	.17	.17	.17	.17	.17	.17	.17	.17	.17
6	.16	.17	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18
$\frac{3}{16}$	.16	.17	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18
7	.16	.17	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18
8	.17	.18	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19
9	.18	.19	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
10	.19	.20	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21
11	.20	.22	.24	.26	.27	.28	.29	.30	.31	.32	.33	.34	.35	.36
12	.21	.24	.26	.28	.29	.30	.31	.32	.33	.34	.35	.36	.37	.38
13	.25	.27	.30	.33	.34	.35	.37	.39	.40	.41	.45	.50	.55	.60
14	.27	.30	.35	.38	.40	.45	.50	.52	.55	.58	.60	.63	.65	.65

Rivets made from smaller wire than No. 14, all lengths, 70 cents per pound.

Tinning, 6 cents per pound extra.

Extras.—Shoulder Rivets and Pointed Rivets, add 2 cents per pound to list.  
Net Extras.—Goods packed in 25-pound boxes, 15 cents per 100 pounds. In packages of 10 pounds and smaller, 25 cents per 100 pounds.

#### Black and Tinned Iron Rivets in Bulk.

Price per pound.

Black. Tinned.

	8 ounce .....	\$0.38	\$0.45
10 "	" .34	.40	
12 "	" .31	.37	
14 "	" .29	.35	
1 pound.....	.26	.32	
$\frac{1}{4}$ pound.....	.23	.29	
$\frac{1}{2}$ pound.....	.22	.28	
$\frac{3}{4}$ " .....	.21	.27	
$\frac{1}{4}$ " .....	.20	.26	
$\frac{1}{2}$ " .....	.20	.26	
$\frac{3}{4}$ " .....	.19	.25	
$\frac{1}{4}$ " .....	.19	.25	
$\frac{1}{2}$ " .....	.19	.25	
$\frac{3}{4}$ " .....	.19	.25	
$\frac{1}{4}$ " .....	.18	.24	
5 "	.17	.23	
6 "	.17	.23	
7 "	.17	.23	
8 "	.17	.23	
9 "	.16	.22	
10 "	.16	.22	
12 "	.15 $\frac{1}{2}$	.21 $\frac{1}{2}$	
14 "	.15 $\frac{1}{2}$	.21 $\frac{1}{2}$	
16 "	.15 $\frac{1}{2}$	.21 $\frac{1}{2}$	

specified, 6 cents per pound advance on above prices.

#### Black and Tinned Swedes Iron Burrs.

Price per pound.

Black. Tinned.

Barrel Rivets.	$\frac{1}{8}$	$\frac{15}{32}$	$\frac{7}{16}$	$\frac{19}{32}$	$\frac{9}{16}$	$\frac{11}{32}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{1}{4}$	$\frac{7}{32}$	$\frac{9}{16}$	$\frac{5}{32}$	$\frac{1}{8}$	$\frac{3}{32}$
	.28	.34	.38	.42	.46	.50	.54	.58	.62	.66	.70	.74	.78	.82
	.29	.35	.39	.43	.47	.51	.55	.59	.63	.67	.71	.75	.79	.83
	.30	.36	.40	.44	.48	.52	.56	.60	.64	.68	.72	.76	.80	.84
	.31	.37	.41	.45	.49	.53	.57	.61	.65	.69	.73	.77	.81	.85
	.32	.38	.42	.46	.50	.54	.58	.62	.66	.70	.74	.78	.82	.86
	.33	.39	.43	.47	.51	.55	.59	.63	.67	.71	.75	.79	.83	.87
	.34	.40	.44	.48	.52	.56	.60	.64	.68	.72	.76	.80	.84	.88
	.35	.41	.45	.49	.53	.57	.61	.65	.69	.73	.77	.81	.85	.89
	.36	.42	.46	.50	.54	.58	.62	.66	.70	.74	.78	.82	.86	.90
	.37	.43	.47	.51	.55	.59	.63	.67	.71	.75	.79	.83	.87	.91
	.38	.44	.48	.52	.56	.60	.64	.68	.72	.76	.80	.84	.88	.92
	.39	.45	.49	.53	.57	.61	.65	.69	.73	.77	.81	.85	.89	.93
	.40	.46	.50	.54	.58	.62	.66	.70	.74	.78	.82	.86	.90	.94
	.41	.47	.51	.55	.59	.63	.67	.71	.75	.79	.83	.87	.91	.95
	.42	.48	.52	.56	.60	.64	.68	.72	.76	.80	.84	.88	.92	.96
	.43	.49	.53	.57	.61	.65	.69	.73	.77	.81	.85	.89	.93	.97
	.44	.50	.54	.58	.62	.66	.70	.74	.78	.82	.86	.90	.94	.98
	.45	.51	.55	.59	.63	.67	.71	.75	.79	.83	.87	.91	.95	.99
	.46	.52	.56	.60	.64	.68	.72	.76	.80	.84	.88	.92	.96	.100
	.47	.53	.57	.61	.65	.69	.73	.77	.81	.85	.89	.93	.97	.101
	.48	.54	.58	.62	.66	.70	.74	.78	.82	.86	.90	.94	.98	.102
	.49	.55	.59	.63	.67	.71	.75	.79	.83	.87	.91	.95	.99	.103
	.50	.56	.60	.64	.68	.72	.76	.80	.84	.88	.92	.96	.100	.104
	.51	.57	.61	.65	.69	.73	.77	.81	.85	.89	.93	.97	.101	.105
	.52	.58	.62	.66	.70	.74	.78	.82	.86	.90	.94	.98	.102	.106
	.53	.59	.63	.67	.71	.75	.79	.83	.87	.91	.95	.99	.103	.107
	.54	.60	.64	.68	.72	.76	.80	.84	.88	.92	.96	.100	.104	.108
	.55	.61	.65	.69	.73	.77	.81	.85	.89	.93	.97	.101	.105	.109
	.56	.62	.66	.70	.74	.78	.82	.86	.90	.94	.98	.102	.106	.110
	.57	.63	.67	.71	.75	.79	.83	.87	.91	.95	.99	.103	.107	.111
	.58	.64	.68	.72	.76	.80	.84	.88	.92	.96	.100	.104	.108	.112
	.59	.65	.69	.73	.77	.81	.85	.89	.93	.97	.101	.105	.109	.113
	.60	.66	.70	.74	.78	.82	.86	.90	.94	.98	.102	.106	.110	.114
	.61	.67	.71	.75	.79	.83	.87	.91	.95	.99	.103	.107	.111	.115
	.62	.68	.72	.76	.80	.84	.88	.92	.96	.100	.104	.108	.112	.116
	.63	.69	.73	.77	.81	.85	.89	.93	.97	.101	.105	.109	.113	.117
	.64	.70	.74	.78	.82	.86	.90	.94	.98	.102	.106	.110	.114	.118
	.65	.71	.75	.79	.83	.87	.91	.95	.99	.103	.107	.111	.115	.119
	.66	.72	.76	.80	.84	.88	.92	.96	.100	.104	.108	.112	.116	.120
	.67	.73	.77	.81	.85	.89	.93	.97	.101	.105	.109	.113	.117	.121
	.68	.74	.78	.82	.86	.90	.94	.98	.102	.106	.110	.114	.118	.122
	.69	.75	.79	.83	.87	.91	.95	.99	.103	.107	.111	.115	.119	.123
	.70	.76	.80	.84	.88	.92	.96	.100	.104	.108	.112	.116	.120	.124
	.71	.77	.81	.85	.89	.93	.97	.101	.105	.109	.113	.117	.121	.125
	.72	.78	.82	.86	.90	.94	.98	.102	.106	.110	.114	.118	.122	.126
	.73	.79	.83	.87	.91	.95	.99	.103	.107	.111	.115	.119	.123	.127
	.74	.80	.84	.88	.92	.96</td								

**Fayette R. Plumb.**—A revised discount sheet has been issued by Fayette R. Plumb, Frankford, Philadelphia, in which quotations are given on his extensive line of Hammers, Hatchets, &c. It will be seen that a good many changes are made, most of them being in the way of advance, slightly higher prices being named on some of the goods, among which may be mentioned Riveting, Engineers', B. S. Hand and Machinists' Hammers, also heavy Hammers and Sledges and B. S. Tools. The discount sheet, which applies to his catalogue of 1892 and supplements 1 and 2, is as follows; terms, 60 days, or 2 per cent. for cash in ten days:

Discount.  
Per cent.

**Hammers.**

"Artisans' Choice," Octagon Pattern	40 and 12½
Adze Eye Nail	40 and 12½
"Artisans' Choice," A. E. B. F. and A. E. Nail	40 and 12½
Adze Eye and Adze Eye Bell Face Nail	40 and 12½
Plain Eye Nail	40 and 12½
Vulcan Tool Company's Adze Eye Nail	50 and 10
Vulcan Tool Company's Plain Eye Nail	50 and 10
Quaker City Mfg. Company's Adze Eye Nail	50 and 10
Brad	50
Carpet	50
All Adze Eye Farriers'	50 and 10
Plain Eye and English Farriers'	50 and 10
"Tinners' Favorite" Riveting and Paneing	50 and 10
"Tinners'" Riveting and Paneing	50 and 10
Adze Eye Riveting	50 and 15
Plain Eye Riveting	50 and 15
Engineers'	60 and 5
Blacksmiths' Hand	60 and 5
Coopers'	60 and 5
Chipping	60 and 5
Prospecting	60
Carriage Ironers'	60
Machinists', Round Pattern	60 and 10
"Mechanics' Pride," Octagon Pattern	60 and 10
Ball Pein	50 and 15
Machinists', Octagon Pattern	60 and 10
Horseshoe Turning	50
Shoe	40 and 10
Bill Posters'	40 and 10
Brick	40 and 12½
Cornice Makers'	40 and 12½
Belgium and Cobble Pavers'	40 and 12½
Picks, Prospecting	40 and 5
Hatchets, S. C. S., Shingling, Half, Claw and Lath	40 and 12½
Broad	40 and 12½
A. E. B. P. Shingling and Half	40 and 12½
Boston Pattern Lathing	40 and 12½
Underhill "	40 and 12½
A. E. B. P.	40 and 12½
Chicago Pattern "	40 and 12½
Philadelphia "	40 and 12½
Fireman's	40 and 12½
Ice	40 and 12½
Shingling and Lath	40 and 12½
Claw and Lathing	40 and 12½
Barrel and Broad	40 and 12½
Vulcan Tool Company's Shingling and Half	50 and 10
Vulcan Tool Company's Claw and Lath	50 and 10
Vulcan Tool Company's Broad	50 and 5
Warehouse	40 and 12½
Axes, Boys' and Hunters'	40 and 12½
Broad, Ohio Pattern	40 and 12½
"Pennsylvania or Pittsburgh Pattern	40 and 12½
Broad, Western Pattern	40 and 12½
"New Orleans"	40 and 12½
"Canada"	40 and 12½
"Ship"	40 and 12½
Adzes, Carpenters'	40 and 12½
Railroad	40 and 12½
Adzes, Ship Carpenters'	40 and 12½
Hooks, Bush, Axe Handle, Auckland and Two Ring	50
Cleavers and Choppers, wrapped iron handles	40
Cleavers and Choppers	40
Axes, Butchers', German Pattern	40
Cleavers, Butchers', German Pattern	40
Beef Splitters	40
Hammers, Drilling or Striking, extra Tool Steel	70
Hammers, Drilling or Striking	75 and 15
Hand Drilling and Stonecutters'	75 and 10

Napping	75 and 10	(Supplement No. 2).....40 and 12½
Macadamizing	75 and 10 and 5	Cleavers and Splitters (Supplement No. 2).....40
Sledges, Stone	75 and 15	Axes (Supplement No. 2).....40
Hammers, Stone Breaking	60	Knives, Hedge (Supplement No. 2).....50
Axes, Stone	70	Mattocks, Asphalt, Improved Philadelphia Pattern (Supplement No. 2).....50
Hammers, Spalling or Stone	75 and 15	Chisels (Supplement No. 2).....65 and 5
Spalling or Stone, Vulcan Tool Company's	75 and 15	Splitting (Supplement No. 2).....50
Reels, Masons'	75 and 10	Wedges, Lake Superior Pattern (Supplement No. 2).....75 and 15
Hammers, Masons'	75 and 10	Coal (Supplement No. 2).....75
Sorting	75 and 10	California Pattern (Supplement No. 2).....75
Bush, with Leaves	60	
"	60	
Vulcan Tool Company's Drilling or Striking	75 and 15	
Sledges, Vulcan Tool Company's Stone	75 and 15	
Blacksmiths'	75 and 15	
Horseshoe Turning and Coal	75 and 15	
Vulcan Tool Company's Blacksmiths'	75 and 15	
Hammers, Blacksmiths' Hand	75 and 10	
Boiler Makers'	60 and 10	
Anvils, Plow	60 and 10	
Swedges, Fullers, Flatters and Hardies	70	
Set Hammers, Creasers and Punches	70	
Heading Tools and Pritchels	70	
Pincers	60 and 5	
Buttress, Nippers and extra heavy Pinchers	50 and 5	
Button Sets	70	
Tongs, Straight and Curved Lip	60 and 5	
Special Patterns	50 and 5	
Drivers, Coopers'	50 and 5	
Chisels, Blacksmiths' Cold and Hot	70	
Rock Drill Sharpening Tools	70	
Chisels, Hand Chipping and Cape, Extra Tool Steel	60 and 5	
Chisels, Hand Chipping, Crucible Steel, List, 36 cents	60 and 5	
Pitching Tools and Points	50 and 10	
Chisels, Stonecutters' and Brick	50 and 10	
Wedges, Falling	75 and 15	
Oregon Pattern	70 and 15	
"Vulcan Tool Company's,	70 and 15	
Truckee "	70 and 5	
Vulcan Tool Company's Truckee Pattern	75 and 5	
Quaker City Mfg. Company's	70 and 10	
Stone	70 and 10	
Coal	75	
Plugs and Feathers	50 and 10	
Wedges, Saw	70 and 5	
Mauls, Wood Choppers', Oregon Pattern	70 and 15	
Wood Choppers', Vulcan Tool Company's Oregon Pattern	75 and 15	
Wood Choppers', Washington Pattern	75 and 15	
"Straight cut	75 and 15	
Ship	75 and 10	
Railroad	75 and 15	
Vulcan Tool Company's Railroad	80 and 5	
Punches, Railroad Track	70	
Chisels, Railroad Track	70	
Rail Tongs	60	
Forks and Wrenches	50 and 5	
Crowbars, Pinch and Wedge Point	70	
Bars, Railroad Tamping and Lining	70	
"Claw	70	
Picks, Boiler and Mill	50	
Quarry	75 and 10	
Stone	75 and 10	
Railroad	60 and 20	
"Tamping	60 and 15	
Ore	60 and 15	
Contractors'	60 and 7½	
Surface	60 and 15	
Drifting	60 and 15	
Pole	60 and 15	
Common Eye, Coal	60	
Adze Eye, Coal	60	
Mattocks, Long and Short Cutter	60 and 20	
Long and Short Cutter, Light Pattern	60 and 20	
Pick	60 and 20	
Asphalt	60	
Hoes, Grub	60 and 10	
Grub, Southern Pattern	60 and 10	
Froes, Coopers'	50 and 10	
Picks, Railroad, Solid Cast Steel	60 and 20	
"Tamping, Solid Cast Steel	60 and 15	
Railroad, Tamping, Solid Cast Steel	60 and 15	
Surface, Solid Cast Steel	60 and 15	
Drifting, "	60 and 15	
Pole, " "	60 and 15	
Common Eye, Coal, Solid Cast Steel	60	
Adze Eye, Coal, Solid Cast Steel	60	
Eyes, Pick, Railroad and Tamping	60 and 15	
Surface and Drifting	60 and 15	
Stakes, Cornice Makers'	50	
Hammers, Assorted Nail, Farriers' and Riveting (Supplement No. 2).....40 and 12½		
Hatches, Nickel Plated Octagon Pole (Supplement No. 1).....40 and 12½		
Silver Bronzed, Octagon Pole (Supplement No. 1).....40 and 12½		

**Files.**—The File market is in a condition very far from satisfactory, there being very active competition among some of the leading makers, and as a result prices are low and uneven.

**Axes.**—Under date 27th ult., Cleveland Axle Mfg. Company, Canton, Ohio, announce the following changes in the price of Axes on quantities of 100 or less, taken within usual contract period, with regular terms and freight allowance :

*Common and Concord Axes.*

No.	Iron. Cents per pound.	Steel. Cents per pound.
1, Common Loose Collar	3¼	3
2, Solid Collar	4	3¾
3, Common Axles, light beds.	4	3¾
4, Solid Collar Axles, light beds	4½	4½
5, Concord Express Axles, loose collars	4½	4½
6, Concord Express Axles, solid collar, turned box	5	4¾
6½, Or Special Express Axles, solid collar, hard box Spindles		5¾
<i>Net Extras, No. 1 to 6½ Axes.</i>		
Coach shape		¼
Square and octagon		⅜
Short beds, under 20 inches		2
Size under 1½ inches		1
Size 3½ to 3¾ inches, inclusive		1½
Size 3¾ to 4 inches, inclusive		3
Case Hardening		½
Welding Axles		1½
No. 2, 6 and 6½, one piece (in quantities of one size)		1

*Half Patent Axes.*

Discount. Per cent.
Nos. 7 to 14.....70
Nos. 19 to 22.....70 and 5

**The Ohio Hardware Association.**

**A**CTIVE MEASURES are being taken to increase the membership of the Ohio Hardware Association, the organization of which in Columbus, on October 10, we have already referred to. The formation of county associations is referred to as highly desirable, as through them local abuses can be stopped. Efforts are, therefore, being made in this direction, and the secretary is sending out to the trade circulars giving information in regard to the matter. It is, however, regarded as desirable in order to obtain benefits reaching be-

yond the county limits that the State organization should be strengthened as much as possible, and earnest efforts are being made to secure the co operation of merchants to improve the conditions of the Hardware business.

The scope and object of the association is thus explained in a recent letter from Theodore Butler, the efficient secretary and treasurer of the organization:

The purpose of our association is to count among its members all the Hardware houses in good standing of the State who will approve of the principles of our constitution, and who will do their share toward the improvement of the conditions relating to retail Hardware business. It cannot be to the advantage of either manufacturer or jobber to come in direct competition with their own customers, and for this reason I do not believe that a single jobber will take exception to our principles. I believe that most of the trouble arising from this unjust competition is caused by error of judgment on the part of the men in charge of the correspondence rather than intentional errors of the members of firms, and can easily be avoided. There are many staples (and their number is increasing daily) which are being sold at ruinous prices, and Hardware profits have ceased to return a reasonable revenue to capital invested. It is my opinion (and I have tested the practicability of this opinion) that local organizations should be formed to regulate the prices of staples, and that the Hardware dealers of the counties should be assisted in this local organization by the State organization.

It would be a very difficult task for the secretary of the State association to correspond with the individual members of the State, but on the contrary he could keep in close touch with county associations. A very valuable credit system could be established; complaints against the railroads can be treated with more effect; legislative measures can be promoted, and last, but not least, the social feature of this organization at the yearly meeting on February 2, 1895, will be a source of great pleasure to all members.

## Bicycle Notes.

### The Price of Bicycles for 1895.

**I**N ADDITION to the announcements made in our issue of last week regarding the prices at which various manufacturers will list their Bicycles for the coming season, we are enabled, through the courtesy of other makers, to give further information, which will be of interest to the trade:

**F. F. IDE MFG. COMPANY**, Peoria, Ill., manufacturers of High Art Bicycles, advise us in regard to their prices for 1895 as follows:

We contemplate building for the '95 trade our racer and road racer at \$150. The Ide Special and Lady's Ide Special at \$140 and the Lady Ide at \$100. Besides these we shall place a machine on the market to compete with other standard makes to list at from \$100 to \$110.

**E. B. PRESTON & CO.**, Chicago, makers of the Czar Bicycle, state that with their experience so far in making wheels, they feel for the present at

least that \$125 should be the list, or selling price at retail; and that they shall so list the Czar for 1895.

**THE ROYAL CYCLE WORKS**, Marshall, Mich., will list their three high grade wheels for the coming season as follows: The Royal Limited at \$100, the Royal Red Head at \$110, and the ladies' Royal at \$100.

**DEMORREST MFG. COMPANY**, Williamsport, Pa., expect as usual to have two grades of Bicycles, one to sell for \$75, and the other for \$100. The makers state that the \$100 wheel will have all the nuts, screws and bolts hardened, so that they will retain their shape until the wheel is completely worn out.

**THE PEERLESS MFG. COMPANY**, Cleveland, Ohio, makers of Triangle Bicycles, will list their line of wheels at \$100, including two for men and two for ladies. Their Blue Bird, a track racer, being a special wheel, will list higher than the other machines.

**THE CRAWFORD MFG. COMPANY**, Hagerstown, Md., and 72 Reade street, New York, will have on the market for the season of 1895 eight machines listed as follows: Nos. 19 and 20, 28 inch, diamond drop frame, strictly high grade, at \$75; Nos. 17 and 18, 28 inch, diamond and drop frame, at \$60; Nos. 11 and 12, 26 inch, diamond and drop frame, at \$50; Nos. 13 and 14, 24 inch, diamond and drop frame, at \$40. The company state that their line will be second to none in improvements; that every one will be strictly up to date, of highest grade and thoroughly guaranteed.

**THE ROCHESTER CYCLE MFG. COMPANY**, Rochester, N. Y., will bring out a wheel for 1895, weighing 25 pounds, to meet the demand for a substantial, warranted, first-class light Bicycle at a moderate price, and will list it at \$75. In addition they will place upon the market the regular highest grade Rochester, which they state will contain all the features of excellence that it is possible to combine with the very latest improvements. This wheel will weigh about 22 pounds and will be listed at \$100. In addition the company will make a special Rochester track racer, which will be made extra light and will be listed at \$125.

### Manufacturers' Comments.

Manufacturers, as a rule, are listing their machines in accordance with what may be termed the 1895 price of \$100, and in some cases lower. This they probably see their way clear to do as a result of the diminished cost of material, the use of improved machinery and the increased facilities for manufacturing Bicycles. Some manufacturers, however, state emphatically that they will not be influenced by the policy other manufacturers may pursue, depending upon the high grade of their machines and upon the sale and reputation which they have enjoyed in the past to justify a higher list for 1895 than the popular one. A Western

manufacturing concern refer to the situation as follows:

While there may be a reduction in the prices of Bicycles by a few manufacturers, who have found it a hard matter to dispose of their machines, we are not in that boat. Does it not look unreasonable for a manufacturer to reduce the price of his wares unless compelled to do so, and does it not show that the quality is such that they will no longer command their former price? We are now and shall continue turning out the very finest machines that skill, art and science can produce. Such machines cannot be built and marketed at the price that some makers propose to list their '95 product. Instead of setting a list price on our machines and then building them of a quality to correspond, we first build the machine to our ideas and then place on it a list price that we can afford to sell it for. There is a vast difference between the two methods.

After referring to the price of \$100, which has been made for 1895, an Eastern manufacturer writes as follows:

We presume that this will somewhat regulate the price of certain standard high grade wheels. We are firmly of the opinion, however, that the time is past when any one or two concerns in this country can regulate the price of the best Bicycles. We know of some makers who will list their machines, or a part of them, at a higher price than \$100 in spite of the announcement. In fact, we know that there is a demand from a certain class of riders for the best with all the latest improvements, even if the purchasers have to pay a little more for them.

Western manufacturers, in looking at the matter as affecting the jobber and retailer, express themselves as follows:

We did not ask advice from other makers when we began making wheels and have none to offer others. We make strictly a high grade, expensive wheel and we think there is a demand for just such an article. We shall have a price on our particular make of wheel. What other makers may offer or sell theirs at will not influence us just at present, whether large or small makers. The quality of the goods will make the price on all makes, later on, we think. The jobber or retailer, or he who is really doing the hard work in selling wheels, however, in our judgment, should have some careful consideration and protection, and if the list price is cut down so low as will leave him with no profit for his work and expense, it surely will kill his energy to push such makes and lessen the sales of all other makers.

A Pennsylvania manufacturer finds no occasion for a cut in price as far as demand is concerned, as the following will indicate:

We see no necessity for a cut in prices, as we find, as in previous years, no difficulty in placing all the machines we can build; we are even now behind on orders and have been for some time. For the past two months we have been working full time, and in addition to this are working four nights each week—a thing unheard of at this season.

A Western manufacturing concern, who expect to place their high grade wheels at high grade prices in 1895, comment upon the situation as follows:

The prices for Bicycles for the coming season is a matter that is creating considerable excitement at the present time in Bicycle circles. We presume that you understand that a company

have issued a circular stating that their standard price will be \$100. What this means we are unable to state, as it does not infer anything outside of those that they have on hand at the present time.

A New York State manufacturing concern give the following reasons for listing their Cycles at popular prices, and also state why they think they will not be losers by so doing:

It has not been customary with our company to come to any hurried conclusions upon so important a subject as that of prices, but consider that it is of special importance for the coming season that prices should become known as early as possible in order that the trade may adjust itself to any changes that occur. Appreciating the fact that your journal is the foremost one of its kind reaching the Hardware trade and that you are taking an active interest in our branch, we write you the first letter on the subject of prices. To begin with, there has been and is a growing demand for a substantial first-class light Bicycle at a price that comes within the reach of the average man's pocketbook. We mean the multitude of riders who want something good in a modern, up to date, light wheel, at a very moderate cost. There have been a number of these machines in previous years upon the market which were listed at the highest grade price, which have come unfairly in competition with more expensive wheels which were in reality better value from the fact that they were standard high grade goods.

We feel that in placing our prices at popular rates and adhering to our established reputation in quality that the large number of increased sales and the natural reduction in the cost of our materials will protect us against losses in profits. In placing the vehicle in the reach of the multitude it will largely tend to increase the popularity of bicycling everywhere.

An Indiana manufacturer, referring to the grade of machines which will be offered for the coming season, remarks as follows:

In a general sense the prices on Bicycles this year is considerably less than during the past season—that is, for the same grade of goods—but I think there is a general improvement in style and quality all along the line. The manufacturer as well as the buyer seem to be anxious to hold up the quality.

### Harrison & Wolfe.

**H**ARRISON & WOLFE, 54 Broad street New York, exporters, will open a branch house and sample room in Mexico City on or before December 1 next. They will represent a number of very prominent American manufacturers among the large trade of that country. This will be on a strictly salary basis, their mission being to increase the trade of their respective houses by being on the spot to exhibit samples, meet and overcome prejudices and objections, explain the intricacies of the various lines and quote prices at which the buyers there can obtain the goods, it being of no interest to Harrison & Wolfe through what channel the order passes. Orders can be sent to commission houses in New York or direct to the manufacturer. Mr. Harrison who has had 20 years' Hardware experience, eight years of which were with Sargent & Co. as export manager, will spend some months

in Mexico establishing the business, in connection with a good Hardwareman who will go from here with him and eventually be left in charge. Mexico is a natural and profitable market for American productions, and it is gratifying to see strong and successful houses reaching out for it.

### Hardware Merchants' and Manufacturers' Association of Philadelphia.

**A** MEETING of this association which, it is expected, will be of more than usual interest will be held on Tuesday evening, November 20, at 6 p.m., in the Hotel Metropole. The subject for discussion will be as to whether or not the present system of syndicate buying is advantageous to the trade.

### Important Cutlery Sale.

**A**MONG our special notices this week E. Bissell, Son & Co., give particulars in regard to the last Cutlery sale of the season, which is set down for Tuesday and Wednesday, November 13 and 14. This important sale will include several thousand dozen Table Knives and Forks, Pocket Knives, Butcher Knives, Carvers, &c., comprising, it is stated, a large line of desirable patterns of fine goods suitable for the Thanksgiving and holiday trade; also silver plated Tea and Table Spoons and Forks, Medium Knives, Dessert Knives, Fruit Knives, Nut Picks, nickel plated Scissors and Shears, &c. A line of silver plated Casters, Tea Sets, Writing Sets, Tea Caddies, Card Receivers, &c., will also be disposed of, together with 50 fine single and double barrel breech loading Guns, and 2,000 pairs of Winslow's American Club Skates, 7½ inch to 12-inch.

### Tool Chests.

**A**MERICAN TOOL COMPANY, 200 West Houston street, New York, are equipped with a well assorted stock of tool chests with which to supply dealers for holiday trade, ranging from 25 cents to \$266 each, including tools. The boxes are suitable for presents for children, youths and adults who devise many home conveniences which would never be indulged in if a carpenter were to be employed. There are boxes also intended for professional mechanics, stocked with the best makes of tools, with many sizes and assortments of tools to select from, together with 28 styles and sizes of empty tool chests for amateurs, carpenters, machinists, farmers, planters, &c.; also suitable for railroad and mining purposes, leaving the owner free to select his own tools.

### Requests for Catalogues, Price-Lists, &c.

**N.** C. LARSEN, Hardware merchant, of Bellevue, Idaho, has opened a new store at Silver City, Idaho, and advises us that he will

be pleased at that point to receive from the trade copies of catalogues, discount sheets, &c. While the Silver City establishment will receive Mr. Larsen's special attention, the store at Bellevue will also be continued.

Adam Sharp of Sweetwater, Ill., has just opened a new Hardware store at that place, and requests that copies of catalogues and price-lists from manufacturers and jobbers be sent to him.

### Trade Items.

**I**N A SPECIAL NOTICE in this issue Alfred Field & Co., 93 Chambers street, New York, call attention to the fact that for some time past Joseph Rodgers & Sons, for whom they are sole agents in this country, have been annoyed by the fact that Pocket Knives are put on the market with "Rodgers' Pattern" stamped on blades. They are advised that this stamping is an infringement of their rights, and they give notice warning the trade against handling Knives so marked.

**A**USTIN & EDDY, manufacturers of special Hardware, whose plant at 115-119 Broad street, Boston, Mass., was damaged by fire October 13 last, advise us that the damage has been to a large extent repaired and the factory is now in running order. General improvements, however, are in progress, which will result in increased capacity

**C**HARLES DALY of Schoerling, Daly & Gales has just returned from a flying trip to Europe, began about six weeks ago, he having arrived on the "Paris," November 3.

**T**HE HOLMES & EDWARDS SILVER COMPANY, 2 Maiden lane, New York, have issued a neat pamphlet catalogue of 53 pages, fully illustrated, of the lines of goods they make. On pages six and seven are 13 half size illustrations of their Rialto pattern, recently brought out, now made in Tea, Coffee, Dessert and Table Spoons, Dessert, Medium, Berry and Oyster Forks, Butter Knife, Sugar Shell, Berry, Orange and Five O'Clock Tea Spoons. A full line of flat ware is shown in the following pages. They have added to their line Gold Aluminum Solid Metal Tea, Dessert, Table, Coffee, Orange and Five O'Clock Tea Spoons, Sugar Shells, Dessert and Medium Forks and Butter Knives. This is a new metal of gold color, which will always look the same and can be cleaned as any solid ware. This metal is of 14 karat color and acids will not touch it.

### Circulars, &c.

**T**HE AMERICAN IRON & BOLT COMPANY, Cincinnati, Ohio, with works at Newport, Ky.: Nuts and Bolts. In addition to a full line of Nuts and Bolts the company manufacture Bar and Angle Iron, Wagon Box Iron, Heavy Band, Tire, Horseshoe Iron, Steel Tires, Sheet, Roofing, Tank, Jail and Safe Iron and Boiler Plates. A well printed and conveniently arranged catalogue illustrates the various lines of Nuts and Bolts made by them, and in addition gives fac-simile of label for Bolt boxes in colors.

## Hon. Samuel Winslow.

**I**N OUR ISSUE 25th ult. we published a brief sketch of the career of Samuel Winslow, founder of the Samuel Winslow Skate Mfg. Company of Worcester, Mass., and ex-Mayor of that city. In this issue, in connection with portrait, we give a more detailed account of his business life.

Mr. Winslow was born in Newton, February 28, 1827, and was a descendant of Kevelin Winslow, brother of Governor Edward Winslow of the Massachusetts colony. At the age of 11 years he was obliged to go to work in a shop. His education up to that time had been acquired in the public schools of his native town. He was thoroughly industrious, even at that age. The shop in which he worked was for the manufacture of cotton machinery. He showed great skill and inventive genius, forcing his way to the front so rapidly that at the age of 20 he was foreman of the shop. In addition to contributing his share toward the support of the family, he worked overtime, and earned money which he advanced to two of his brothers, to enable them to pay their way through college and fit themselves for professional careers.

At the age of 21 he held his first public office, being elected in 1848 to the Prudential Committee in the Newton Upper Falls school district. He was soon after elected clerk of the corporation which organized the Boston & Woonsocket division of what is now the New York & New England Railroad. He was also for a number of years a member of the town fire department and several other local organizations.

Before coming to Worcester in 1855 he had gathered together quite a little property, and in that city he formed a partnership with his brother, Seth C. Winslow, and together they started a machine shop, the firm name being C. & S. Winslow.

In 1857 the manufacture of Skates was begun. In this field the Messrs. Winslow were especially successful. The works were first located in the old Merrifield building on Cypress street, and they remained there for 21 years, after which the plant was removed to the new machine shop erected by Mr. Winslow on the corner of Mulberry and Asylum streets, the rapidly increasing business demanding larger facilities.

In 1857 the firm made 25 pairs of Ice Skates, of which 19 pairs were sold. In 1858, anticipating a larger demand, they started in by making 200 pairs,

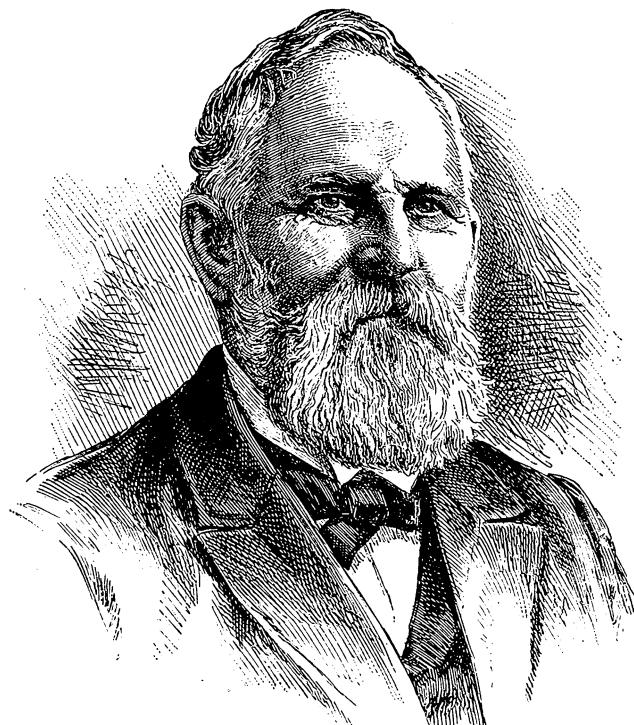
but before the end of the year had manufactured and sold 2500 pairs. The business thus established increased steadily. In 1871 Seth C. Winslow died, and Samuel Winslow purchased his interest, thereafter conducting the business alone until 1886, when the Samuel Winslow Skate Mfg. Company were incorporated, Mr. Winslow retaining a controlling interest and becoming president and treasurer of the corporation. His son, Col. Samuel E. Winslow, was, however, the active manager of the concern.

Up to 1872 the business had consisted entirely of the manufacture of ice skates. In that year J. L. Plympton, who first brought out the roller skate, but who never made a great success of his invention, employed Mr. Winslow to make skates for him. Some of these

About 50 styles of ice and 15 styles of roller skates are manufactured.

While prominent as an enterprising and successful manufacturer Mr. Winslow was also a conspicuous figure in politics. He was elected Mayor of Worcester for four successive terms, was a member of the Common Council of the city in 1865 and 1866, a representative from Worcester in the General Court in 1873 and 1874 and Alderman of the city in 1885. Mr. Winslow was also a delegate to the National Republican convention at Minneapolis in 1892. In politics Mr. Winslow was a Republican.

Mr. Winslow was also connected with several of the local banks and for the past three years had been prominently identified with the development of suburban street railways. Mr. Winslow had been strongly devoted to his home fireside, and though not adverse to the duties and functions of social life they did not attract him, and he much preferred the happiness and contentment of domestic life. During his lifetime he was a liberal giver to worthy charitable objects, although his charities were never heard of except through the beneficiaries. In his death the city of which he was so conspicuous a business, political and social figure loses one of its most enterprising and public spirited citizens, the esteem in which he was held being indicated by the many tributes paid to his memory.



HON. SAMUEL WINSLOW.

skates were exported to Europe and India. In 1880 Mr. Winslow invented the Vineyard roller skate, the sale of which he energetically pushed. This skate became immensely popular, and Mr. Winslow is referred to as the producer of the roller skating craze which from 1880 to 1885 swept over the country. Hundreds of rinks were built in cities and towns, in many of which Mr. Winslow was financially interested. The demand for Mr. Winslow's skates became so great that for a period of two years his factory was run 23 hours out of the 24. In 1886 the sale of roller skates in this country fell off, but many were and are still manufactured, largely for export to Japan, India and South America. Ice skates are now, however, the principal manufacture of the company, who in the busy season employ from 200 to 300 men, the plant having a capacity of 6000 pairs of skates a day.

YORK, on January 1, 1894, and that the latter continue to hold it notwithstanding statements to the contrary. They refer to the fact that A. Field & Co. are carrying a large stock of the goods and will be pleased to give prompt attention to inquiries and quote factory prices. The company intimate that every effort will be made by them to maintain the high quality of the Clippers which they are putting on the market.

THE AMERICAN IRON & BOLT COMPANY, with offices at 75 and 77 West Third street, Cincinnati, Ohio, whose advertisement appears elsewhere in this issue, announce to their friends and the trade in general that they have recently purchased the mill and bolt works formerly operated by the late L. M. Dayton, at Newport, Ky., and are now engaged in the manufacture of Bar, Roofing and Stove Pipe Iron, Bridge Rods, Hinges, Bolts, Nuts and Gimlet Pointed Coach Screws. An entirely new catalogue is now ready for distribution to the trade, copies of which will be gladly sent upon application.

## Shop System of Keeping Track of Jobs.

BY ROSS F. RAINY.

**I**N CONDUCTING A SHOP IT IS necessary that the workmen be governed by some such conditions as the following: The foreman should have absolute control over all the men in the shop and should exercise judgment as to who are the proper men to work on the several jobs. Some man may be experienced in one line of work and could work to better advantage in that line, while in another line he could not work to as good advantage.

The foreman should distribute his men so as to get the best results, and should not show too much authority over them. It is better to treat them civilly, as they will show more respect and will do better work.

It is not generally best to discharge a man without the consent of the proprietor, but at the same time the foreman should give his men to understand he has that right.

The shop should be thoroughly cleaned once a week.

In a great many shops there is no system in regard to keeping the men's tools. The general rule in some shops is that the man who gets to the shop first gets the preference. In our shop, we have a large cabinet containing a large number of drawers, giving each man one drawer, with a key for the same; the keys not passing. The foreman keeps a duplicate key of each, and each man is held responsible for his tools.

### Diagrams.

The books and slips used in this system of keeping track of jobs and shown in this article are as follows:

Fig. 1, bid book.

Fig. 2, written bid to contractors.

Fig. 3A, record book, job entered.

Fig. 4, order book, in which all contract and repair jobs are entered when received. The contract jobs are copied from the bid book, Fig. 1.

Fig. 5, dray slip.

Fig. 6, charge book.

Fig. 7, time check.

Fig. 8, credit book.

Fig. 3B, record book, cost of time on job.

Fig. 3C, record book, cost of material delivered to the job, including carfare, drayage, &c.

Fig. 3D, record book; cost of material returned as unnecessary to complete the job.

Fig. 9, receiving book.

Fig. 7A, time check.

Fig. 10, order slip on tin shop.

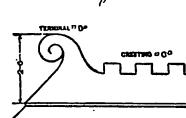
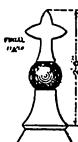
Books and slips. Figs. 1, 2, 3A, 3B, 3C, 3D and 10 are kept by a clerk in the shop office.

Books and slips Figs. 4, 5, 6, 7, 7A, 8 and 9 are kept by the foreman.

**T**HE SYSTEM.

In explaining the books and slips enumerated I shall begin at the beginning: A contractor comes to our office

and asks us to bid on the tin and galvanized iron work on a certain house. We in turn ask him if we can see the plans and specifications. He replies that they can be seen at a certain architect's office (the architect's name in this instance being S. M. Johnson.) Our representative who attends to that department repairs to the architect's office to see the plans and

		<i>P J Irvin House 44th &amp; City</i>	
		<i>S M Johnson Arch</i>	
		<i>Specifications</i>	
1893	Jan 10	Cover the entire roof of buildings and roof of both porches with Scott Extra Coated Tin using 1 c for flat coverings and 1 X for gutters and valleys	
		All to be put on standing seam and double locked 14 x 20 tin	
		Tin to extend over cornice caps	
		All to be painted one coat underside and two coats outside	
		All conductors to be 4 Galvanized and as shown on plan each short Conductors from porch roof to connect with main	
		Finals. Terminals <i>as</i> creasing to roof Galv Iron anchoring on Plan.	
		Main Roof. $14\frac{1}{2} \times 17 - 16\frac{1}{2} \times 17 - 9 \times 11 - 33\frac{1}{4} \times 17 - 11\frac{1}{2}$ ft.	
		Front Porch $8 \times 21$	192 "
		Back Porch $8 \times 13$	$\frac{104}{148\frac{1}{4}}$ ft. C PDR
		20' Gutter.	WWWW D.R.
		$16 - 18 - 20 - 24 - 6 - 20$	WA PO
		20' Valley $13 - 13 - 13 - 13 - 13 - 6$	88 ft. - WT
		4' Galv Loud.	WL ZS
		$26 - 26 - 26 - 26 - 3$	107 ft. - WL
		1' Cap $22 - 6$	28 ft. - D
		2' Journals <i>a</i>	488 a.m.
		2' Terminals <i>b</i>	088 2.00
		5' ft Creasing <i>c</i>	WOD
			WPL PA
			
		<i>Tin Galv Iron Work for \$174 25</i>	
		<i>List of Builders</i>	
		<i>A. J. McMullen</i>	
		<i>James Doran</i>	
		<i>Silas Jones</i>	
		<i>A. O. Adams</i>	
		<i>D. J. Redpath</i>	
		<i>All bids sent Jan 11/94</i>	

Keeping Track of Jobs.—Fig. 1.—Bid Book.

specifications. He takes a copy of the specifications in a memorandum book which he carries, as well as the measure- a memorandum of all the bidders. Then upon arriving at our office he copies both the specifications and measure- the following words are used in the cost and extensions: **W O R L D S f a i r.**  
1 2 3 4 5 6 7 8 9 0

Jan 11 1893

Mr. A. P. Adams  
Dear Sir 5<sup>th</sup> ave City We propose to put on  
all the Tin & Galv. Iron on the T. P. Irwin  
house complete according to plans and specifications for the sum of  
One Hundred Twenty Four <sup>78</sup>/<sub>100</sub> Dollars \$174 <sup>78</sup>/<sub>100</sub>

We propose to put on  
all the \_\_\_\_\_ on the \_\_\_\_\_  
house complete according to plans and specifications for the sum of  
\_\_\_\_\_ Dollars.

All estimates are contingent upon strikes or unavoidable accidents or delays.

Very Respectfully,

J. C. STEWART & CO.,

*J. C. Stewart* Manager

If you are bidding on any work or in need of anything in our line, let us know and we will be pleased to figure on it, and are sure we can save you money.

Keeping Track of Jobs.—Fig. 2.—Written Bid to Contractors.

<i>J. C. Stewart</i>		<i>A. P. Adams Cont.</i>
S. M. Johnson Arch.		
Jan 14	All roofs 1 c 14 <sup>1</sup> / <sub>2</sub> 0 Scotch Ex Coated	
	Gutters & Valleys 1 x 10 <sup>1</sup> / <sub>2</sub>	
Main Roof	119 ft	
Front Porch	19 "	
Back	102 "	
	1487 ft.	
Galv. Coud 4.	107 "	
Lap Flash 1.	28 "	
20' Gutter	104 "	
20' Valley	88 "	
2 Finials		
2 Terminals		
Cresting	5 "	
	Contract #, 14 1E	
	Jan. 30 1893	
	Charged Page 3075 Day Book	

Keeping Track of Jobs.—Fig. 3A.—Record Book—Job Entered.

ments of all tin and galvanized iron work necessary to complete the job as per plans and specifications; he also takes

ments, with a list of the bidders, in the bid book, Fig. 1. The cost and asking price on this job are made the same, and

After the job is written up in the bid book, a written bid, as shown in Fig. 2, is sent to all the bidders. We then have our man keep his eye on the job until it is let to the successful bidder, who we in turn have our representative see, and if we are the lowest bidders on said work or stand in with the contractor, we get the job, which in this case it is taken for granted we did. The contractor represented in my method is A. P. Adams.

We then enter the job in our record book, Fig. 3A, from the bid book, Fig. 1, itemizing only the material and brands specified. At the same time we enter the job complete, precisely as in our bid book, in our foreman's order book, Fig. 4, so that he will know what kind of material to make up. The tanners then go to work and get the material ready to deliver to the job, and any galvanized iron work is turned over to our galvanized iron workers to get ready. The job is thus entered up in every detail, and material ready to be delivered to the job as soon as the word to go ahead and put on the roof is received.

When the word to go ahead is received, we have the material to be put on first delivered to the job, per dray slip in Fig. 5, also showing the time of

delivery, &c. The balance of the material is delivered when needed. The tinners in the mean time have arrived at the building and are ready to work.

All material sent out by the foreman is entered in his charge book, Fig. 6, and marked whether contract or repair work, and if repair work, what the charges are. Each evening the time checks, one of which is shown in Fig. 7, which were given to the men in the morning, are marked O. K. by the foreman, who in turn delivers them to the office together with the charge book already referred to and the credit book, Fig. 8.

Referring to the printed time check, it will be found that each man keeps the time spent on each job, and the time going and coming is charged up to said job. In repair work all material used on said job is itemized on the time check as well as in the charge book. Nothing but the time on contract jobs is posted from the time checks. The other charges coming from the charge book are kept by the foreman.

Each evening the time on contract jobs is posted to the different jobs in the record book to cost of time, Fig. 3B; also all material to cost of material sent out, Fig. 3C, and any credits to cost of materials returned, Fig. 3D.

All repair jobs are posted from the foreman's charge book each evening in the regular day book. The receiving book, Fig. 9, showing everything coming into the shop, is kept by the foreman.

When jobs are complete the tinner working last on said job is supposed to notify the foreman of the fact, or in some cases it is best for the tinner to note it on his time check, Fig. 7A.

The method of keeping a job as explained in the various departments of the record book I think an excellent one. A book is used which, when opened out, measures about 22 inches. The left hand page is divided equally in two parts. The original contract and time are kept on the left hand page, and the material sent out, cost of same, car fare, drayage, &c., and the material returned and cost of same are kept on the right hand page, thus showing the condition of the whole job at a glance. The men's time is figured at the several prices, also the cost of material sent out, including care fare, drayage, &c. Adding these together gives the total cost. Subtracting from this amount the material not used gives the net cost. Subtracting this from the original bid gives the net profit, according to my method. The job is then charged upon the day book at the original contract price, as noted under the contract price, Fig. 3A.

#### Cash Sales.

Referring to the manner in which cash sales are treated I would say: Our office and shop are 100 feet apart. A person comes into the office and wants a piece of tin, zinc, copper or speak-

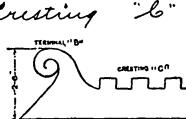
ing tube, and wishes to pay for the purchase at the time. We give an order on the tin shop, as shown in Fig. 10. When the goods are furnished the same are charged to the office in charge book, Fig. 6. This is necessary in order to keep a complete record of everything going out of the tin shop.

The British steamer "Montezuma" cleared from New Orleans for Liver-

#### Selling and Repairing Bicycles.

BY ROSS F. RAINY.

MANUFACTURERS have, that is a majority of them, come to the conclusion that the retail Hardware dealers are better able to take care of their trade locally than a jobber can who covers a State or part of a

	<i>J. P. Morris House 44th St City</i>	<i>S. M. Johnson Arch</i>	<i>A. P. Adams. Cont.</i>
Jan. 10		<i>Specifications</i>	
		Cover the entire roof of building and roof of both porches with Scott Extra coated Tin, using 'c' for flat coverings and 'x' for gables and valleys All to be put on standing seam and double lashed 14 x 20 tin Tin to extend over cornice cap. All to be painted one coat underneath and two coats outside All conductors to be 4' Galvanized and as shown on plans with shrouds Conductors from porch roof to connect with main. Finals, Terminals & Capping to be of Galv. Iron as shown on plans Main Roof. 119 ft. Front Porch 19 " " Back 102 " 20" Gutter 104 " 20" Valley 88 " Galv. Coud 4. 107 " Cap Flash 28 " 2 Finals "A" " 2 Terminals "B" " 5 ft capping "C" "	
			
Jan. 16	<i>On Contract.</i>	<i>Chas. Donaghys.</i>	
	<i>Over His 3rd Ave</i>	<i>Alterate to Exchange St</i>	
	<i>Repair Furnace (put it in first class shape)</i>	<i>Repair Spouting } Extra</i>	
17		<i>Repair Flash Windows</i>	

Keeping Track of Jobs.—Fig. 4.—Foreman's Order Book.

pool on Saturday with 14,935 bales of cotton, 82,000 bushels of wheat, and other freight. This is claimed to be the largest cargo of cotton ever shipped from any port.

State, at least the retail Hardware dealers of good standing are being given the preference. There are a great many points in favor of having

an agency with a retail Hardware dealer. The time was when only the better class of people could afford to buy a wheel; now the Bicycle is within reach of all, and there are a different class of people now riding wheels.

### Possible Customers.

There is the professional, or some-

a wheel himself and letting others try it he gets them interested, and once he gets them interested he can very likely sell them. Next come contractors of all kinds. These people are getting to ride more and more each season, and are learning the advantages of a wheel.

The contractors have found Bicycles

### **Class of Bicycles.**

A retail dealer putting in a line of wheels should, as his best wheel, carry a strictly high grade machine—one that is well known and one of the very best kind, that he can guarantee. Here is where the dealer's reputation in the wheel business begins, and he

RECEIVED OF	Jan 16, 1893
J. C. STEWART & CO.,	By <i>Tinners</i>
In Good Order and on	
Credit of.....	
J. P. Lunn 44 <sup>#</sup> St City	House
Left shop	107 50
Around back	10 50
Time of delivery	3 hrs
Delivered by Driver, <i>Harry Hamilton</i>	Received by <i>James Blair</i> , Sign Your Own Name.

### *Keeping Track of Jobs.—Fig. 5.—Dray Slip.*

times called amateur, who rides for a living. These people the retail dealers cannot sell; in fact no one can sell them. The majority of them ride the wheel of the manufacturer who will

of such a benefit to them that the cost of a new machine at the beginning of the season would at the end of the season more than balance the price he paid for it, taking into account car fare

should maintain it. If he sells an A1 machine for one season, the next season it becomes better known, and so on from season to season, and the time comes when it takes little talking to sell the wheel, except, perhaps, to explain the improvements from time to time. He should also handle a cheaper line of wheels from his high grades, in sizes 24-inch, 26-inch and 28-inch. A good assortment for a Hardware dealer would be \$100 for his strictly high grade machine, then \$75 and \$50, the \$75 and \$50 wheels being 26-inch and 24-inch respectively, the \$100 being 28-inch wheels. This to cover the gents' and boys' wheels. For ladies' wheels would advise \$100 for 28-inch and \$75 for 26-inch wheels. These, six in all, make a fair assortment of samples, good enough for any Hardware dealer.

## Display of Bicycles.

The line of wheels should be shown or displayed in the front part of the store, one in the window, where they catch the customer's eye when he first enters. When two friends enter a store on some business other than that of buying a wheel, the fine display attracting their attention, one will be overheard saying to the other : "Say, —, I believe I will get a wheel this season ; what do you think ?" An attractive display a great many times leads to sales.

#### Selling a Wheel

A dealer should at all times give his high grade machine the preference over other wheels he may have; that is,

do the best by them. Next comes the pleasure rider, who only rides his wheel to and from work and in the evening merely for the pleasure and recreation there is in it; here are the parties with whom the dealer does a great deal of his business. The dealer very likely has a great many friends who never rode a wheel, and by riding

and other expenses that he would otherwise be subjected to. This is a time of progress in the Bicycle business. The jobbers, dealers, business men, contractors and all parties in general are taking advantage of the benefits offered and are riding wheels. The ladies, too, are getting right in line with the men.

1893			
Jan 16	J. O. Brown & Co 44½ St.	J. O. Adams Cont.	
	1075 ft 1 c 14½o Scott Ex Coal		
	104 " " Galv. Coal.		
	104 " 20" Gutters	Contract	
	88 " 20" Valleys		
	Carfare 30"		30
	Oil snowdrift		
	Brown & Co 3rd Ave		
	Repairing Furnace 4 hrs	50	200
	10c sheet iron 10x 22		20
	1 bolt		10
	Office		
	1 pc Zinc		25
	1 joint stove pipe		25
17	J. O. Brown & Co 44½ St.	A. O. Adams Cont.	
	568 ft 1 c 14½o Scott Ex Coal		
	28 ft 1" Cap Flash		
	2 Female	Contract	
	2 Female		
	5 ft Lining		
	Carfare 30"		30
	Horse wagon 44 Drive 3 hrs 40"		120
	Chas. Dougherty		
	Astel St Exchange St.		
	Repairing spouting, Flashing Windows		125
18	J. O. Brown & Co Carfare		50

Keeping Track of Jobs.—Fig. 6.—Charge Book.

he should always talk his best machine up first, then, if his customer does not want a high priced machine, show him the next grade machine, explaining the wheels in detail, giving all the desirable points in the different makes and comparing one wheel with another. Of course the high grade wheel has more points in its construction than the next wheel, therefore comparing the two wheels often leads the customer to purchase the high grade machine. The more high grade machines a dealer sells the more it will lead to selling, and the better the reputation he will get.

#### The Bicycle Department.

If the proprietor is not well posted in the Bicycle business, and does not care to pay a man a high salary to conduct that department, it would be advisable for him to give one of his clerks full charge of it. Let him study the wheel sold in every detail, assist him in securing the trade papers on the subject, allowing him to attend the Bicycle

meets and shows in the town or vicinity. A salesman showing a wheel should be pleasant and agreeable, and well posted in every detail. In explaining the wheel he should not run down any other make, but explain to the customer all the favorable points in his wheel from beginning to end, and if the customer wants a wheel he can tell whether he wants the one that is being shown. A clerk should not wait from time to time for a customer to ask questions—in fact, some customers know very little about the good points about a wheel; all they know is that they want a good wheel. Then tell him all you know, and after explaining the wheel from front to rear you can size your man up and the chances are he will buy.

#### A Disgusted Merchant.

Now take the other side of the subject. A dealer puts in a similar line of wheels; he is not posted in the business, does not ride a wheel, none of his clerks are posted, nor do they ride. The dealer thinks: "Well, my competitor is putting in a line and I will have to do the same thing or take a back seat." At the same time he wishes to have as little expense connected with it as possible. Things go along fairly well for a while. He sells a few wheels. Then a well posted wheelman comes in and asks to see their high grade machine, asks questions in regard to its make up, what kind of a tire it has, could you put on another tire if he wanted it, what is the weight with wood rims, and numerous other questions. Some of the questions the salesman can answer, others he cannot. Then he becomes embarrassed and contradicts himself time and again without knowing it. The result is the wheelman goes out disgusted, and very likely will never come back. This will hurt a dealer's reputation more than anything else. After this the wheels sell slowly, the dealer gets disgusted, with a fair stock on hand, and wishes he had never seen a wheel. The fact is he does not conduct the business

1893			
Jan 20	J. O. Brown & Co	A. O. Adams Cont.	
	21 ft 1 c 14½o Scott Ex Coal		
	5 " 4 " Galv. Coal.	Contract no credit	
" 21	John Henderson		
	Brown & Co 10½ St.		
	10 ft 20" Valley 1 x o.s.		15
			150
	John James		
	Brown & Co Murdoch Av.		
	10 ft 1 x 10 Flashing		40
	4 ft 3 " Galv. Coal.		40

Keeping Track of Jobs.—Fig. 8.—Credit Book.



traveling salesman for Hibbard, Spencer, Bartlett & Co. of CHICAGO, has purchased a stock of Hardware at EL PASO, where he will open a new store.

That David Stiver will open a new store at STOCKTON.

That O. A. Harrison, Hardware and Implements, LOVINGTON, has sold out.

#### Idaho.

That N. C. Larsen of BELLVUE has opened a new store at SILVER CITY.

#### Indiana.

That Hatfield & Read are Read a new firm

traveling salesman in the employ of the Simmons Hardware Company of ST. LOUIS. Mr. Scott is a well-known local business man.

That R. A. Callender has sold out his Hardware business at GLENCOE.

#### Michigan.

That the Menominee Hardware Company of MENOMINEE will soon commence the erection of a warehouse 100 x 25 feet.

That A. Whitney & Son, Hardware dealers of QUINCY have been awarded the contract for putting in the water works at UNION CITY, to cost \$19,000.

has removed to PLAINVIEW, where he has purchased a Hardware store.

#### Mississippi.

That Thomas Goodwin has retired from the Goodwin Hardware Company of WATER VALLEY.

#### Missouri.

That Thomas B. Crow is closing out his Hardware business at NEW MADRID.

#### New Hampshire.

That the large Stove store of C. M. Bailey, at ROCHESTER, was robbed on the 25th ult.

#### New Jersey.

That F. A. Marvin will soon retire from the Hardware business at PERTH AMBOY.

#### New York.

That Mrs. H. M. Bodine is closing out her Hardware business, at 2192 Fulton street, BROOKLYN.

#### Ohio.

That the Hardware firm of Dunam, Kayser & Co., ST. MARY'S, were dissolved on November 1. Lewis Kayser and Otis E. Dunam have retired from the business, which will be hereafter conducted by W. R. Dunam and Henry Coker.

#### Pennsylvania.

That S. P. Fenn is building a brick addition to his Hardware store at PITTSTON.

That the Hardware firm of Phillips & Etherington, 2936 Market street, PHILADELPHIA, were dissolved by mutual consent on November 1. The business will be continued by Harry A. Phillips and George J. Maisch, under the style of Phillips & Maisch.

That William Feltz & Son have recently opened a new Hardware store at YORK.

That S. S. Bryan, Hardware mer-

Order No.....	This No. must appear on Bill.
Give No Goods Without a Written Order.	
Office of J. C. STEWART & CO.	
M. C. Tinsmith	Jan 15 1894
Please deliver to...earer	
1. Ac. Zinc 25d per lb	
Joints over size, 25	
Chargers office	
J. C. STEWART & CO.,	Ross
Per.....	

Keeping Track of Jobs.—Fig. 10.—Order Slip on Tin Shop.

at WASHINGTON. They will embark in the Hardware and building material business about December 1. Mr. Hatfield was formerly a member of the firm of Hatfield & Palmer, who were succeeded by J. A. Palmer & Son. The new firm expect to open up a stock of about \$10,000.

#### Iowa.

That P. M. Jenks has bought the Hardware and Implement stock formerly owned by W. C. Gerner, BARNSUM. Mr. Jenks was formerly an employee of Mr. Gerner.

That Isaac Odell has disposed of his Hardware business at GILMORE.

That C. E. Danforth & Co. of HAMBURG have sold out their stock of Hardware to F. Toedt.

That the Foster, Bailey & Goodrich Company of GRINNELL have decided to add Hardware to the other lines they are handling.

That C. H. Thomas & Bro., will succeed Thomas & Dougherty in the Hardware business, at CRESTON, about January 1, 1895. E. N. Dougherty having sold his interest in the concern to G. M. Thomas.

That Smith & Sanders, Implement merchants, SOUTH ENGLISH, have sold out to Cheney & Sanders.

#### Kansas.

That the Union Hardware Company of ARKANSAS CITY have been organized with a capital of \$5000. The directors are J. G. Finley, J. S. Short, R. J. Rankin, S. H. Hamilton and Robert Godson.

That D. C. Kennedy, Hardware dealer, ANDOVER, has sold out.

#### Kentucky.

That the Hardware store of John T. Miller, at LEXINGTON, has been sold to J. Frank Vanderen and J. Scott. Mr. Miller has conducted the store for the past 42 years with conspicuous success and has retired from active business. Mr. Vanderen, one of his successors, has for the past eight years been a

Jan	3	James B. Scott 160 10 Bales 1 c 1/2 lb Ex located
5	Austin Obdyke 160 500 ft 2 c. lead.	
	1000 " 3 "	
	200 " 4 "	
6	25 Doz Pasteas for Brick & Wood 6. A. Williams, Son 1000 1/2 + 1/2 solder	
	1500 " Refined	
	Apollo Iron & Steel Co. 5 Bales *18 Galv. sheet iron	
7	Allen 160 12 Pcs Tinner Snips	

Keeping Track of Jobs.—Fig. 9.—Receiving Book.

That Frank S. Bagg will soon embark in the Hardware business at PORT HURON.

#### Minnesota.

That S. A. Anderson will soon open a new Hardware store at DAWSON.

That the Hardware firm of Clark & Srsen of OWATONNA have been dissolved. J. T. Clark will continue the business under his own name.

That R. W. Rockwell of PRESTON

chant, at TITUSVILLE, has doubled the size of his store by adding the room adjoining his establishment, so that his emporium now measures 45 x 115 feet. Mr. Bryan intends to carry an increased line of House Furnishing Goods and conduct business on a more comfortable basis than heretofore.

#### South Dakota.

That J. A. Rose has sold his Hardware store at PIERRE to the Pierre

Mercantile Company, recently organized.

That A. C. Witte's Hardware store at ABERDEEN was burglarized on the 22d ult. About \$100 worth of goods were taken.

#### Tennessee.

That W. F. McDaniel & Co., dealers in Hardware, groceries and drugs, SOUTH PITTSBURG, have sold their drug business to C. L. Ingersoll.

requently necessitates a considerable range of prices.

*White Lead.*—Only moderate orders have been placed for dry Lead and prices stand just about the same as they have been for several weeks. The contest between the independent and the combined corroders is by no means dead, neither is the opposition that comes from producers of inferior prod-

but cheapness seems to have little attraction, and business is almost wholly of routine type. Prices range all the way from 5¢ up to 6¢, according to brand and size of lot.

*Litharge.*—There has been some improvement in sales of the lower grades, but dealings are smaller than usual at this season of the year, and almost invariably at low prices where round lots are involved. Dealings were chiefly at prices on the basis of 4½¢ for both domestic and foreign. High grades have undergone no change in price, but are meeting with very moderate sale.

*Orange Mineral.*—Quite a good business has been done in foreign for future delivery, at very low prices. The sales were chiefly at 6½¢ @ 6¾¢ for German makes in round lots. Higher grades, while selling in a moderate way only, are relatively firmer at 8½¢ @ 8¾¢. Domestic is unchanged in price and selling slowly.

*Zincs.*—The market is quiet and wholly bare of new feature. Deliveries of domestic brands on former contracts are liberal, but not up to the average for this season of the year. New purchases are moderate in the extreme, although specially low prices have been made to induce business.

*Colors, &c.*—No new features have developed in the market for either Dry or Oil Colors. Business has proceeded in about the usual way, and, while on a low level, prices have undergone no decided change. Mixed Paints have been selling well, but not to a sufficient extent to have any decided influence upon values. In fact, the market is quite as

Jan 20	27 ft 1 c 14½ <sup>0</sup> Scotts Ex. Mdd 5 - 4 Galv. Cond cost of material unnecessary to complete job	D R R	W R D
		a	1 R
			175
	Original Bid cost of material alid to job cost of putting on material	121 02 29 15 150 17 175 148 42 26 36 174 18	174 18
	Less cost of material unnecessary to complete job		
	Profit on down hand 44 ± 14		174 18

Keeping Track of Jobs.—Fig. 3D.—Record Book—Cost of Material Returned.

#### Virginia.

That M. M. Morris, formerly senior partner in the Morris Implement Company of GLADE SPRING has been chosen cashier of the bank of GLADE SPRING which was organized a short time since.

That the Bedford Hardware Company, BEDFORD, have been organized. Their store was opened on November 1, with R. H. Thomas as manager.

That Dame & Francis, Stoves, &c., SALEM, have been succeeded by J. T. Dame.

#### Washington.

That the Atkinson-Calhoun Company have been organized at BLACK DIAMOND. The incorporators are J. M. E. Atkinson, Isaac P. Calhoun and Francis J. Burns. The company's capital is \$20,000.

#### West Virginia.

That Kane & Keyser is the style of a new Hardware firm at WEST UNION. The firm have put in a \$2500 stock in a building recently erected.

#### Wisconsin.

That A. W. Vaughan has opened a new Hardware store at LODI.

That an explosion of 6 tons of dynamite occurred in the powder house of J. R. Sharp, a Hardware merchant of CHIPPEWA FALLS, on the 28th ult. The building was a wooden frame structure covered with heavy sheet iron and was 20 feet square. The shock of the explosion was heard 20 miles away.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

#### Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods fre-

TIME CHECK.		
Date	Job	TIME.
Jan 16 1894		
Name, James Blair		
	Name of Job, and Material put on.	TIME.
J. P. Atkinson		H. M.
44 ft 24		
Putting on Mammoth		24
Ph. Standard		
3rd ave		
Preparing Furnace		4
1. Ashland 1022 120x		
Shop Work		1
OT. day		9
Adams Farman		

Keeping Track of Jobs.—Fig. 7A.—Time Check.

uct. Business has been done at 4¢ @ 4½¢ in a wholesale way and at 4½¢ @ 4¾¢ in moderate quantities. Lead in Oil has met with quite good sale, but there is still considerable irregularity in prices and the market is quite as unsteady as it has been during the past month or six weeks. This is partly due to home competition, but it is a plain fact that offers of foreign brands have more or less depressing influence. Upon the whole it looks very much like a buyers' market for the time being.

*Red Lead.*—Little more than routine business has been done. There is enough foreign competition to keep prices low,

flat as it has been at any time during the past two months.

#### Oils and Turpentine.

*Linseed Oil.*—Speculative influence has kept the market for raw material in a more or less unsettled condition; but up to the present time crushers have not been sufficiently influenced to make any new departure. In fact, the general tendency is to keep the prices as high as foreign competition will admit. At the moment offers of English Raw Oil at less than 58¢ are the exception. Domestic product may be secured at 56¢, with usual allowance for package.

*Cottonseed Oils.*—A somewhat ir-

regular market has been experienced. The force of circumstances has served to keep prices low. Efforts in speculative direction to carry them upward have been made with very indifferent result. On the spot there were sales of prime Summer Yellow at 28¢ @ 29¢, and prime crude went at 24¢ @ 25¢. Corresponding prices were accepted for other grades.

*Lard Oil.*—Sales of prime have been made at as low as 55¢ for prime city brands, and quotations above 56¢ are the exception at the present time. This revision of price has led to somewhat freer buying on both home trade and export account, but the supply is still excessive and the market has a weakish appearance.

*Fish Oils.*—There is no change whatever in the condition of crude Sperm Whale or Menhaden Oils in this market, and none is reported from other quarters. In the manufactured Oils there is a fair business, chiefly at about former prices.

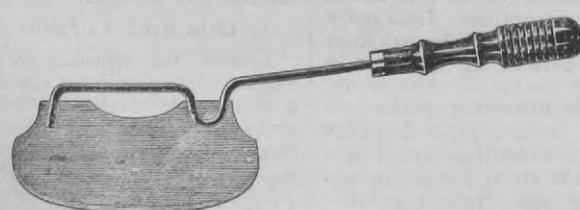
*Miscellaneous.*—Common Olive Oil in barrels has been selling at as low as 55¢ on the spot, and purchases could probably be duplicated at that price. Cocoanut Oils have been selling in a moderate way only, and, while not positively lower, prices still tend more or less in buyers' favor.

*Spirits Turpentine.*—Little change has taken place during the past week. Prices have ranged within the limits of 28½¢ @ 29¢. Speculative interest is not nearly as lively as it was a week or two ago. The trade demand is also light, and the market is at present showing extremely quiet tone.

**A Warning to Exporters to Mexico.**—Manufacturers who are anxious to cultivate an export trade with Mexico should be warned against a new dodge to raise money from which a number of our readers have suffered lately. The scheme is to secure a contract on a commission basis for handling goods in the Mexican market. It is plausibly presented, backed with an apparently accurate knowledge of the country and its needs. The principal proof of good faith, however, is the presentation of a number of bona fide contracts previously secured from other firms. After the business is settled, a small sum is asked for to defray cost of translating into Spanish advertising matter and circulars. Those of the firms who have been heard from report that no business has resulted, so that it looks as though the sole aim is to gather the small amounts in the manner referred to.

#### Family Cleaver.

The cut herewith shown represents a family cleaver, put on the market by Mason & Parker, Winchendon, Mass.

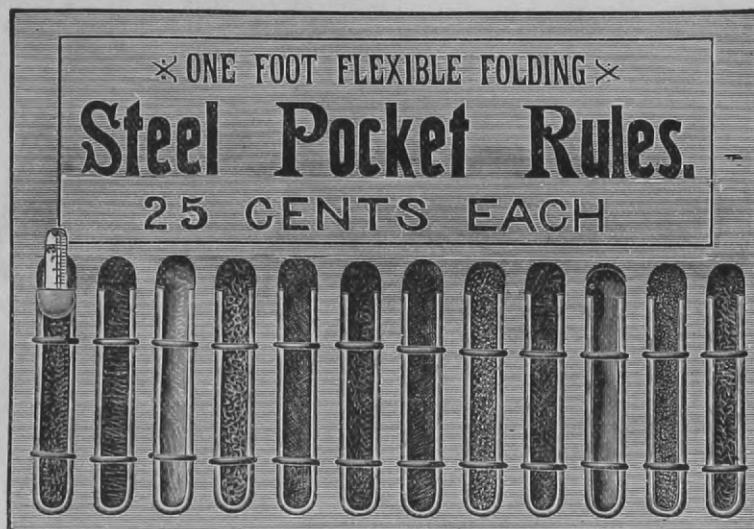


Family Cleaver.

The cleaver is described as being made entirely of steel except the handle, which is wood, cherry finished. The

blade is 6 inches long and of extra heavy stock, riveted to the shank, which is 14 inches long. The tang or handle bar passes completely through the handle, to which it is securely riveted.

inch joints, three fold, put up in metal bound embossed leather cases of assorted colors. The manufacturers state that the rules are light, compact, convenient, durable, suitable to carry in



The Lufkin Display Rule Card.

The manufacturers state that the workmanship and finish of the cleavers is first class, and that they are packed 1 dozen in a box.

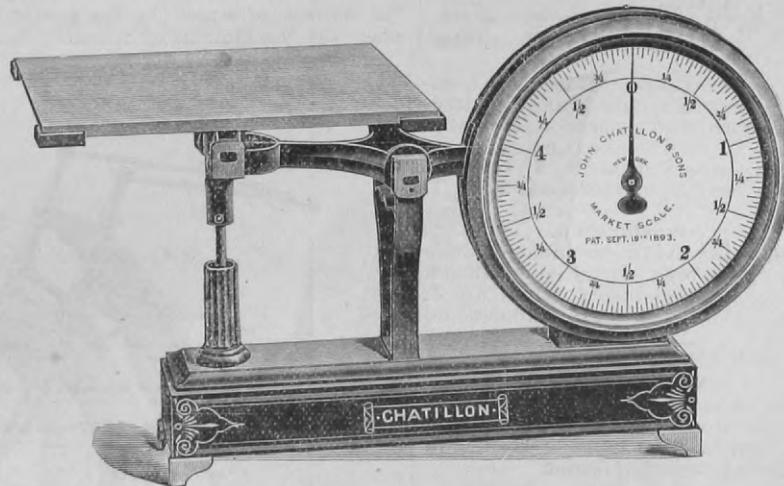
#### The Lufkin Display Rule Card.

The Lufkin Rule Company, Saginaw, Mich., are offering their 1-foot flexible steel folding pocket rules, on cards, as

the vest pocket, and that they are ready sellers. The company will send a sample card of rules at the regular trade price of \$2 per dozen, with 12 cents for postage.

#### Even Balance Market Scale.

John Chatillon & Sons, 85-93 Cliff street, New York, have just put on the



Market Scale with Agate Bearings.

shown in the accompanying illustration. The card is designed as a neat display card to set on the counter or showcase,

market an even balance scale, as here shown. This is introduced as an exceptionally sensitive counter scale, designed largely for market uses. One of its prime characteristics consists in its being fitted with agate bearings, as fine watches are ruby jeweled, to reduce friction and minimize wear. The double dial is 8 inches in diameter, with 10-inch nickelized sash, and so arranged that the pointer can be seen equally well by both buyer and seller. The scale has a marble plate 11 inches square, the extreme length of the scale being 23 inches. The body of the scale is finished in maroon and decorated. The scale can be obtained with dials indicating 5, 10, 20 and 40 pounds at one revolution, by ½, 1, 2 and 4 ounces respectively, at a uniform price.

to increase sales ; each card containing one dozen rules. The rules are made of spring steel, No. 28 gauge, with 4-

**Motor Cycles.**

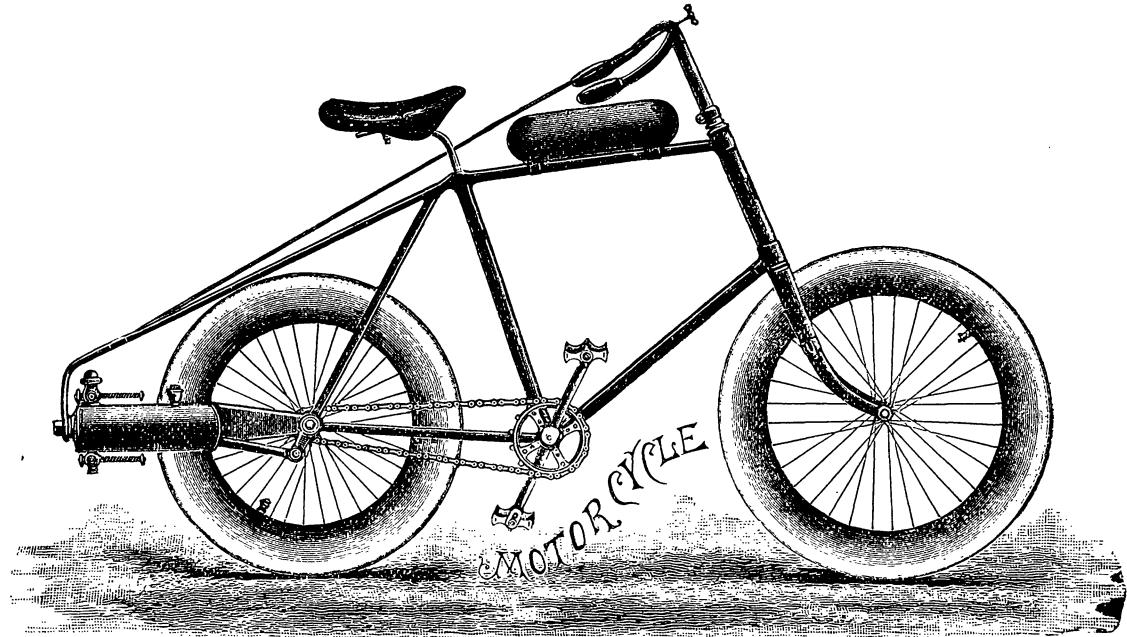
The Motor bicycle, shown in Fig. 1, and the Victoria cycle, shown in Fig. 2, are being introduced by the Motor Cycle Company, Cleveland, Ohio. The driving mechanism of the former con-

It is an impossibility to run the machine until the passenger has taken his position in the saddle. The speed is varied at will by turning the throttle valve, and the machine stopped by closing the valve.

Considered as a whole, the bicycle is designed and constructed with a

gines will outlast the best make of bicycles.

The Victoria Motor cycle was built to supply a demand which a two-wheeled machine would not reach, and to take the place of a horse and carriage, seating two or three persons, side by side.

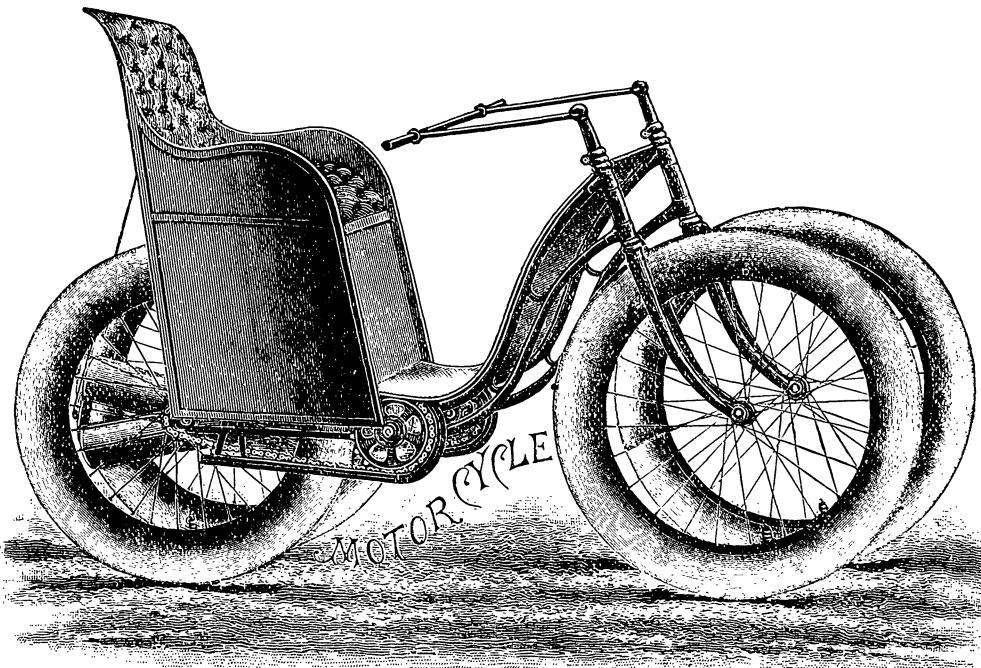


*Fig. 1.—Motor Bicycle.*

sists of two hot air engines—one on either side of the rear wheel—the crank connection being clearly indicated in the engraving, and the general arrangement being similar to a locomotive. The can in front of the operator carries the oil, which is conveyed through the frame of the machine to the cylinders of the engines, where it is mixed with air. Being

view to making it unusually strong and adapted to meet the requirements of all classes of riders and convenient to operate. The front wheels are 24 inches in diameter and the rear ones 22 inches, with 4-inch pneumatic tires, having a non-puncturing strip between the inner and outer cover. The surface presented to the ground when the machine is in operation is

The machine is low and easily entered. The machine is easily controlled, and any person of ordinary intelligence can run it. There is no expense except when in actual use, and which is but a few cents per day. Each machine is guaranteed by the manufacturers for one year. Arrangements are being made for space at the New York and Chicago bicycle exhibits, where it is understood



*Fig. 2.—Victoria Motor Cycle.*

ignited it expands the air and forces the pistons forward. Ordinarily, in engines of this type, a fly wheel is necessary to equal the load; in this case the passenger takes the place of the fly wheel, or, in other words, the velocity of the cycle and the passenger combined pull the engines over the center and compress the charge behind the piston.

about 5 inches in width, giving surface sufficient so that the machine can be ridden over mud, sand, dust, and over rough roads. It may be propelled by foot power if desired. The manufacturers claim that the machine may be run at any speed from 1 to 30 miles an hour, that it will climb hills, run against heavy winds, and that the en-

there will be machines, so that any one wishing to try them may do so.

Thomas Ellison, the well-known statistician of Liverpool is of the opinion that prices have certainly reached bottom the world over, and that their increase from now on will be sure and gradual.

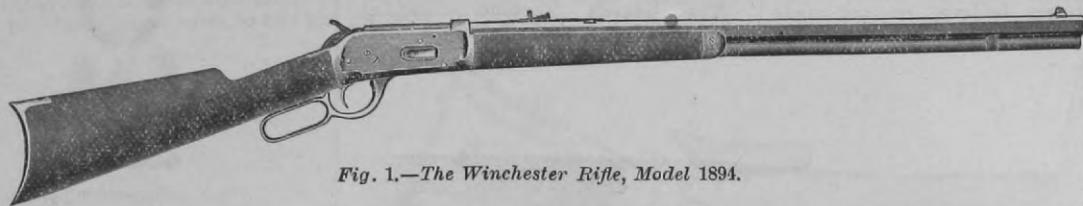
**A New Wrought Padlock.**

A padlock which presents several points of novelty has been placed upon

locked readily by pressing the two sides of the ring together. The internal mechanism is entirely of brass, operated by flat steel keys, the locks being 24 keyed and all different in a dozen. The

parts of the rifle is described as follows by the manufacturers:

"The breech bolt, worked by a finger lever, is automatically locked by a vertically moving block, which shows on

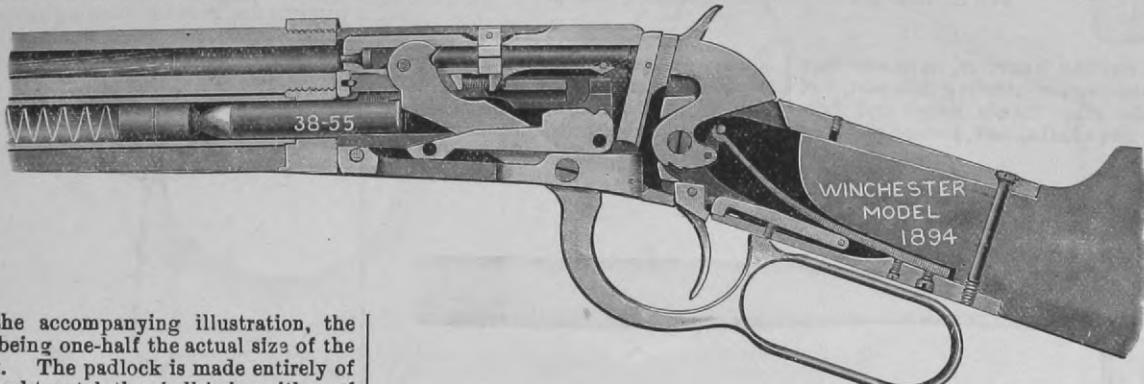


*Fig. 1.—The Winchester Rifle, Model 1894.*

the market by the Yale & Towne Mfg. Company, Stamford, Conn., and 84-86 Chambers street, New York, as shown

steel shell locks are made with brass shackles to avoid the possibility of rusting, and the workmanship and finish

the top of the gun when closed, and covers the whole rear of the breech bolt; the firing pin is automatically

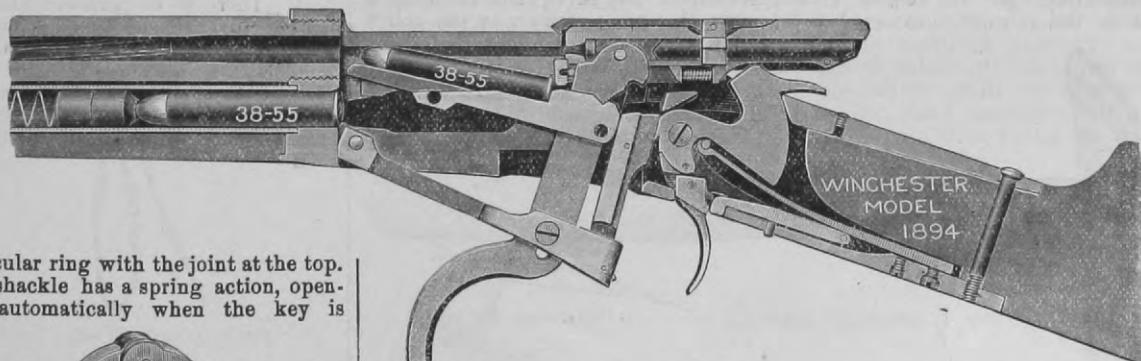


*Fig. 2.—The Interior of Winchester 1894 Model.*

in the accompanying illustration, the cut being one-half the actual size of the lock. The padlock is made entirely of wrought metal, the shell being either of brass or steel, while the shackle and all the working parts are of brass, both for the brass and for the steel shell locks. The shell is rectangular in shape, 1 inch wide by  $1\frac{1}{8}$  long, the shackle forming

are described as being excellent. The padlock is intended to meet the requirements of the market for a thoroughly

withdrawn and the trigger locked until the parts are in firing position, while a heavy hammer and a strong mainspring



a circular ring with the joint at the top. The shackle has a spring action, opening automatically when the key is



*Fig. 1.—A New Wrought Padlock.*

turned, and being self locking when closed. It is explained that the position of the joint makes the form of



*Fig. 2.—Key for Wrought Padlock.*

shackle very convenient, the opening being in the side, rendering the lock easy of removal from the staple when unlocked, and also enabling it to be

well made wrought padlock, which, while possessing a high degree of security and convenience, can also be offered at a moderate price.

**The Winchester Rifle, Model 1894.**

Winchester Repeating Arms Company, New Haven, Conn., and 312 Broadway, N. Y., are offering the latest Winchester rifle, as shown in the accompanying cuts. The operation of

enable the use of the heavy Winchester No. 2½ primer, lessening the chance of misfires and rendering unnecessary the use of a sensitive primer in the magazine."

It is stated that the arrangement of the parts is such as to smoothly, easily and surely cock the hammer, pull out and eject the spent shell, draw the cartridge out of the magazine and insert it into the chamber. The manufacturers remark that the material is made especially to their order and is the best that large experience and buying capacity can produce, while the workmanship is the same as characterizes the rest of their product. The rifle will be adapted to the .32-40 and .38-55 cartridges. The length of the barrel is 26 inches, furnished round and octagon; the gun weighing from  $7\frac{1}{2}$  to  $7\frac{3}{4}$  pounds, varying slightly according to the bore and shape of the barrel. It is explained that a 26 inch magazine will hold nine cartridges, which, with one in the barrel, gives a total of ten shots at the command of the shooter. The manufacturers state that take down rifles in this model will be ready in a very short time.

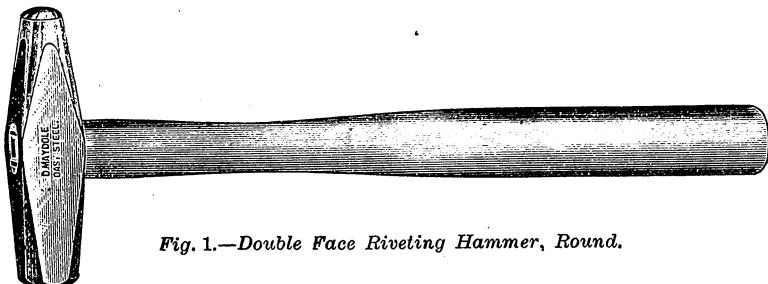
**Riveting and Farriers' Hammers.**

The David Maydole Hammer Company, Norwich, N. Y., are introducing new styles of hammers, among which are those shown in the accompanying cuts. These hammers, the manufacturers believe, are not made elsewhere. It is explained that the double

styles in six sizes, from 3 ounces to 1 pound 10 ounces. The farriers' hammer is made in three sizes, from 9 to 15 ounces.

**Barrett's Bevel Square.**

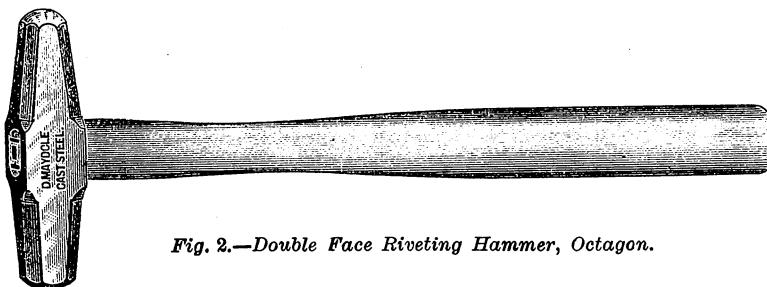
The Leavitt Machine Company, Orange, Mass., are offering a bevel



*Fig. 1.—Double Face Riveting Hammer, Round.*

faced riveting hammers, have one face like the regular riveting hammer, but that the other face is round and full, much like a half sphere, instead of being

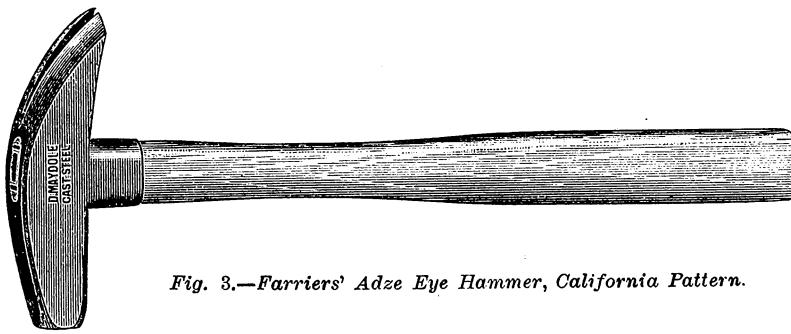
square, as shown herewith. The wood portion of the bevel is made of cocobola, brass trimmed and well finished. The arrangement of the adjusting screw



*Fig. 2.—Double Face Riveting Hammer, Octagon.*

wedge shaped, as in the old style, and, therefore, is a superior tool for nearly all kinds of riveting. The manufacturers point out that the weight of the claws in the farriers' hammer, being

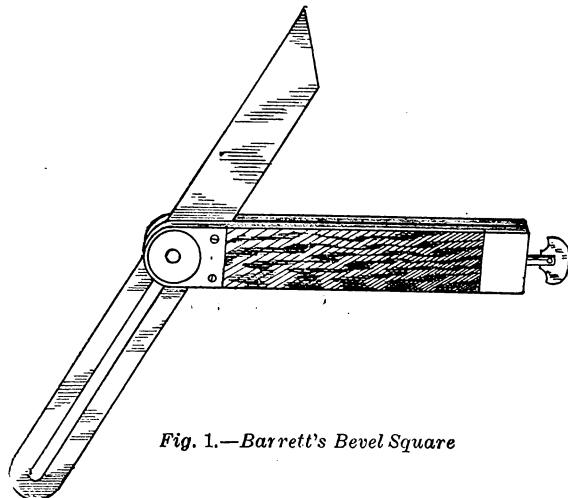
does away with the necessity of a thumb screw on the side of the bevel. The adjusting screw is worked from the end of the bevel, and the point is made that the clutch covers two-thirds



*Fig. 3.—Farriers' Adze Eye Hammer, California Pattern.*

directly in line with the body and face of the hammer, makes it especially good for driving, as it hangs better than a bent claw hammer; also that the claws

of the surface of the blade, thus giving an extra strong grip. Another feature of the bevel is the working of the metal blade against the wood stock,



*Fig. 1.—Barrett's Bevel Square*

are strong, sharp and that the split in them narrows near the hammer's eye. The riveting hammers are made in both

which, it is explained, creates more friction than when both surfaces are metal.

**McGill's Clasps and Carding Loops.**

Holmes, Booth & Haydens, 37 Park place, New York, in addition to the fasteners previously described, are of-



*Fig. 1.—Suspending Clasp.*

ering clasps and carding loops, as here shown. The suspending clasp, illustrated in Fig. 1, is one of a variety of patterns designed for hanging cards, calendars, prints, &c. The fastening shanks



*Fig. 2.—Wire Carding Loop.*

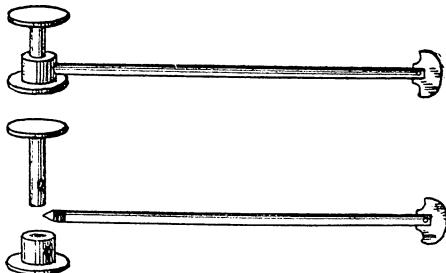
are a part of the clasp, the whole being made of jewelers' metal of first quality and finish. The carding loops are made for wire and cord, as shown in Figs. 2



*Fig. 3.—Cord Carding Loop.*

and 3, and are adapted for the mounting and ready removal of articles of varying diameters on showcases. In use the wire or cord of the loop is passed through the card from its back, passed around the article to be mounted on the card, then brought back through the card and wound around the loop head. The loops are made of the same material as the suspending clasps.

The German Government declares that the embargo placed on American



*Fig. 2.—Detail Views of Adjusting Screws.*

cattle is purely sanitary and not retaliatory in any sense.

**Combination Heater and Cook Stove.**

Edward Miller & Co., 10 and 12 College place, New York, are introducing

heater is designed for oil, having a font with a capacity of 4 quarts, to burn 12 hours. The extreme height as a heater, with the drum, shown in Fig. 2 in posi-



*Fig. 1.—Miller Oil Heater and Cooker.*



*Fig. 2.—Sheet Iron Drum for Heater.*

their Combination heater and cook stove, as shown in Figs. 1 and 2. This

tion, is 30 $\frac{1}{2}$  inches and spread of feet 11 $\frac{1}{4}$  inches. The holder and drum are of Russia iron, with nickeled lamp and trimmings. For cooking the drum is removed and the cast iron extension top with three holes can be quickly placed in position. For roasting and baking Nos. 2 and 3 ovens are furnished. The point is made that all the weight of the cylinders and utensils rests solidly on the font and not on the burner. Each lamp is supplied with an extra flame spreader for illuminating purposes when not used as a heater.

The *Canadian Trade Review* reports that the subscriptions for the 3 per cent. loan of the Government of the Dominion of Canada have aggregated over \$56,000,000, although the loan only called for \$11,250,000. The minimum price was fixed at 95, but the bulk of the loan was subscribed for at an average of 97 $\frac{1}{2}$ .

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**Halters—**

Cover's Adj. Rope Halters..... 40<sup>1/2</sup>%  
 Cover's Adj. Web Halters..... 55<sup>1/2</sup>%  
 Cover's Hemp Horse and Cattle Tie, 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Cover's Jute Cattle Ties..... 70<sup>1/2</sup>%  
 Cover's Jute Horse Ties..... 70<sup>1/2</sup>%  
 Cover's Rope, 7-16-in., Jute..... 70<sup>1/2</sup>%  
 Cover's Rope, 1/4-in., Hemp..... 55<sup>1/2</sup>%  
 Cover's Rope, Jute..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Cover's Saddlery Works Halters..... 33<sup>1/2</sup>%  
 Halters..... 33<sup>1/2</sup>&5%  
 Cover's Saddlery Works Horse and Cattle Ties..... 33<sup>1/2</sup>&5%

**Hammers—****Handled Hammers—**

Atho Tool Co. .... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Buffalo Hammer Co. .... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Hunanson & Beckley ..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Verree.....  
 Cheney's Claw..... 40<sup>1/2</sup>&10%  
 Cheney's Machinist's & Riveting..... 50<sup>1/2</sup>%  
 C. Hammond Mfg. Co. .... 40<sup>1/2</sup>&10<sup>1/2</sup>%  
 Magnetic Tack, Nos. 1, 2, 3, \$1.25..... 10%  
 1<sup>1/2</sup>. 1.50 & 1.75..... 30<sup>1/2</sup>&10%  
 Maydole's, 1894 list..... 25<sup>1/2</sup>&10<sup>1/2</sup>%  
 Peck, Stow & Wilcox. .... 40<sup>1/2</sup>&10%  
 Fayette R. Plumb. ....  
 Artisans' Choice, A. E. Nail..... 40<sup>1/2</sup>&10%  
 Engineers' and B. S. Hand..... 60<sup>1/2</sup>&10%  
 Machinists' Hammers..... 60<sup>1/2</sup>&10%  
 Plate & P., A. E. Nail..... 40<sup>1/2</sup>&10%  
 Other Nail Hammers..... 60<sup>1/2</sup>&10%  
 Sargent's, 1894 list..... 40<sup>1/2</sup>&10<sup>1/2</sup>%  
 Warren & Nobles, new list..... 25<sup>1/2</sup>&10%

**Heavy Hammers and Sledges—**

8 lb and under..... 35<sup>1/2</sup>  
 8 to 5 lb..... 35<sup>1/2</sup>  
 Over 5 lb..... 35<sup>1/2</sup>  
 Wilkinson's Smiths. .... 10<sup>1/2</sup>&10%  
 Wadsworth's, 1894 list..... 10<sup>1/2</sup>&10%

**Handcuffs and Leg Irons—**

See Police Goods.

**Handles—****Cross-Cut Saw Handles—**

Atkins'..... 40%  
 Champion..... 45<sup>1/2</sup>&10%  
 Ely's Perfection..... 40%  
 Sensible, # doz. Fr. .... 55.00, 50<sup>1/2</sup>&10%  
 Iron, Wrought or Cast—

Bar Door, W. doz. \$1.40..... 20<sup>1/2</sup>%  
 Bronze Iron Drop Latches..... 40%  
 Chest, Sargent's list..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Door or Thumb.  
 Nos. .... 0 1 2 3 4  
 Per doz.... \$0.90 1.00 1.05 1.50  
 60<sup>1/2</sup>&10<sup>1/2</sup>%

Jap'd Store Door Handles—Nuts, \$1.62;  
 Plate, \$1.10; no plate, \$0.88..... 10%  
 Roggin's Latches..... 40<sup>1/2</sup>&10<sup>1/2</sup>%

**Wood—**

Anger, assorted..... # gr 5.00  
 Anger, large..... # gr 7.00  
 File, assorted..... # gr 2.75

Brad Awl..... # gr 2.00  
 Apple Firmer Chisel, ass'd. .... # gr 5.00  
 Apple Firmer Chisel, large..... # gr 6.00  
 Hickory Firmer Chisel, ass'd. .... # gr 4.50  
 Hickory Firmer Chisel, large..... # gr 5.00  
 Socket Firmer Chisel, ass'd. .... # gr 3.00  
 Socket Framing Chisel, ass'd. .... # gr 5.00  
 Chisel, Fibre Head..... 33<sup>1/2</sup>%  
 Hammer, Hatcher, Axe, &c. .... 40<sup>1/2</sup>&55%  
 Hoe, Rake, Shovel, &c. .... 60<sup>1/2</sup>&10%  
 Pat. Auger, Douglass. .... 4 set \$1.25  
 Pat. Auger, Ives'..... 30<sup>1/2</sup>&10%  
 Pat. Auger, Swan's. .... 4 set \$1.00  
 Saw and Plane..... 40<sup>1/2</sup>&10<sup>1/2</sup>%

**Hangers—**

Bar Door, New England..... 70<sup>1/2</sup>&5%  
 Bar Door, old patterns..... 70<sup>1/2</sup>&10<sup>1/2</sup>%  
 Barry. .... 60<sup>1/2</sup>&10%  
 Best Anti-Friction..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Boss..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Carrier Steel Anti-Friction. .... 60<sup>1/2</sup>&10%  
 Champion..... 60<sup>1/2</sup>&10%  
 Chicago Anti-Friction..... 60<sup>1/2</sup>&10%  
 Clinch Anti-Friction..... 55<sup>1/2</sup>&55%  
 Crescent..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Cronk's Patent, Steel Covered..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Duplex (Wood Track)..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Economy, \$6.00..... 60<sup>1/2</sup>&10%  
 Hamilton Wrought Steel Track..... 60<sup>1/2</sup>&10%  
 Interstate..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Kidder's. .... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Lane's New Standard..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Lane's Parlor..... 40<sup>1/2</sup>&10%  
 Lane's Standard..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Lundy's Steel Parlor..... 40%  
 Magic..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Matchless..... 60<sup>1/2</sup>&10<sup>1/2</sup>%  
 Moody..... 45<sup>1/2</sup>%  
 Moore's Baggage Car Door..... 38<sup>1/2</sup>%  
 Moore's Elevator..... 38<sup>1/2</sup>%  
 Moore's Railroad..... 38<sup>1/2</sup>%  
 Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15  
 40<sup>1/2</sup>&10<sup>1/2</sup>%

Orleans Steel..... 55%  
 Paragon No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50  
 Paragon Parlor, por set. .... \$2.00  
 Pendulum, Payson's. .... 40<sup>1/2</sup>&10%  
 Perfection..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Richards'..... 30<sup>1/2</sup>&10%  
 Samson Steel Anti-Friction..... 55%  
 Star..... 40<sup>1/2</sup>&10<sup>1/2</sup>%  
 Stearns' Anti-Friction..... 20<sup>1/2</sup>&10%  
 Stearns' Challenge..... 25<sup>1/2</sup>&10%  
 Sterling..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Terry's Ideal..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Terry's Modern..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Terry's Shield..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Terry's Solid..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Terry's Wrought Single Strap..... 50<sup>1/2</sup>&10%  
 Victor, No. 1, \$15.00; No. 2, \$10.50; No. 3, \$18.00  
 Warner's Pat..... 20<sup>1/2</sup>&10%  
 Wild West..... 50<sup>1/2</sup>&10<sup>1/2</sup>%  
 Zenith for Wood Track..... 55%

**Harness Snaps—See Snaps.**

**Hatchets—**  
 American Axe and Tool Co.  
 Blood's. ....  
 Hunt's. ....  
 Hurd's. .... 40 & 10%  
 Mann's. .... @ 50%  
 Underhill's. ....

O. Hammond & Son. ....  
 Fayette R. Plumb. ....  
 Collins. .... 10%  
 Buffalo Hammer Co. ....

Kelly's. ....  
 P. S. & W. Co. .... 50 & 50%  
 Sargent's & Co. .... &10%  
 Schulte, Lohoff & Co. ....  
 Ten Eyck Edge Tool Co. ....

**Hay and Straw Knives**

See Knives.

**Hinges—****Blind Hinges—**

Clark's, Nos. 1, 3, 5, 1868, Old Pattern.....

75<sup>1/2</sup>&10<sup>1/2</sup>%

Nos. 1 and 3, Tip Pattern, 75<sup>1/2</sup>&10<sup>1/2</sup>%

No. 50, Buffalo Noiseless, 40, 60

and 65..... 75%

Buffalo Reversible, Nos. 3, 2, 11,

1 and 9..... 70<sup>1/2</sup>%

No. 1, Cottage, for Wood only, 80<sup>1/2</sup>&10%  
 No. 1, Diamond, for Wood only, 80<sup>1/2</sup>&10%  
 Dic L. & P. Nos. 3, 2<sup>1/2</sup>, 2, 1<sup>1/2</sup>, 1, 0,  
 0, 4 and 5..... 75<sup>1/2</sup>&10%  
 No. 28, Empire Reversible..... 75<sup>1/2</sup>&10%  
 Lull & Porter, Nos. 3, 2<sup>1/2</sup>, 2, 1<sup>1/2</sup>, 1, 0,  
 4 and 5..... 75<sup>1/2</sup>&10%  
 Mortise Gravity, Nos. 2, 4, 4<sup>1/2</sup>, 6, 8, 9,  
 and 10..... 50<sup>1/2</sup>&10%  
 Huffer..... 75<sup>1/2</sup>&10%  
 Parker..... 75<sup>1/2</sup>&10%  
 North's Automatic Blind Fixtures, No.  
 2, for Wood, \$3.00; No. 3, for Brick,  
 \$11.50.....

Reading's Gravity..... 75<sup>1/2</sup>&10%  
 Sargent's, Nos. 1, 3, 5, 11, 12, 18,  
 75<sup>1/2</sup>&10%  
 Shepard's:  
 Acme, Lull & Porter, Nos. 3, 2<sup>1/2</sup>, 2,  
 1<sup>1/2</sup>, 1, 0, 0, 4 and 5..... 75<sup>1/2</sup>&10%  
 Buffalo Gravity Locking, Nos. 1, 3  
 and 5..... 80<sup>1/2</sup>&10%  
 Champion Gravity Locking, No. 75<sup>1/2</sup>&10%  
 Clark's or Shepard's 1868, Old Pat-  
 tern, Nos. 1, 3 and 5..... 75<sup>1/2</sup>&10%  
 Clark's or Shepard's Tip Pattern,  
 Nos. 1, 3 and 5..... 75<sup>1/2</sup>&10%  
 Double Locking, Nos. 20 and 25..... 70<sup>1/2</sup>&10%  
 Empire, Nos. 101 and 103..... 75<sup>1/2</sup>&10%  
 Niagara Gravity Locking, Nos. 1, 3  
 and 5..... 80<sup>1/2</sup>&10%  
 Noiseless, Nos. 50, 60, 65 and 55..... 75<sup>1/2</sup>&10%  
 S. L. Lull & Porter, Nos. 3, 2<sup>1/2</sup>, 2,  
 1<sup>1/2</sup>, 1, 0, 0, 4 and 5..... 70<sup>1/2</sup>&10%  
 Pioneer, Nos. 00, 45 and 54..... 70<sup>1/2</sup>&10%  
 Steamboat Gravity Locking No. 10.....  
 80<sup>1/2</sup>&10%

**Gate Hinges—**

Automatic, # doz \$12.50, 50%  
 Clark's, Nos. 1, 2, 3, ... 60<sup>1/2</sup>&10%  
 N. E. Reversible, # doz \$7.80, 60<sup>1/2</sup>&10%  
 N. E. Standard, # doz \$6.00, 60<sup>1/2</sup>&10%  
 N. Y. State, # doz \$4.50, 60<sup>1/2</sup>&10%  
 Shepard's Nos. 1, 2, 3, ... 60<sup>1/2</sup>&10%  
 Western, # doz \$4.20, 60<sup>1/2</sup>&10%  
 Extra 50% given on many of these Hinges.

Acome..... 30%  
 American..... 20%  
 Bardsey's Patent Checking..... 15%  
 Barker's Double Acting..... 25%  
 Bonner's Jappened..... 35%  
 Bonner's All other Kinds..... 30%  
 Buckman's..... 15<sup>1/2</sup>20%  
 Champion..... 60%  
 Chicago..... 30%  
 Columbia..... 20%  
 Crown..... 20%  
 Devore, No. 1..... 20%  
 Freetop..... 20%  
 Geer's Spring and Blank Butts..... 40%  
 Gem..... 20%  
 Ideal No. 3..... 20%  
 J. G. C. Covered, # gro. \$30. 50%  
 Knoxall..... 20%  
 New Idea No. 1..... 20%  
 New Idea No. 2..... 20%  
 New Idea Dbl. Acting..... 45%  
 No. 10 Matchless..... 60%  
 No. 25 Unbreakable..... 60%  
 Oxford..... 20%  
 Reliable..... 20%  
 Rex..... 20%  
 Royal..... 60%  
 Samson..... 60<sup>1/2</sup>&10%  
 Stearns' Noiseless Floor Hinge,  
 # set \$5.00..... 20<sup>1/2</sup>&10%  
 Surprise..... 20%  
 Union Mfg. Co. .... 25%  
 Union Spring Hinge Co.'s list,  
 March, 1886..... 20%  
 Wiles, No. 1, # gro. \$10. 20<sup>1/2</sup>&10%  
 22, 1894. strap and T. list May ..... 60<sup>1/2</sup>&10%  
 Corrig'd Strap and T. .... 60<sup>1/2</sup>&10%  
 Plate Hinges, 8, 10 & 12 in., # D. .... 5%  
 Providence, over 12 in. # D. .... 4%  
 Rolled Blind Hinges, Nos. 32 and 34..... 60<sup>1/2</sup>&10%  
 Rolled Blind Hinges, Nos. 22 and 24..... 55<sup>1/2</sup>&10%  
 Rolled Plate..... 55<sup>1/2</sup>&10%  
 Rolled Raised..... 70<sup>1/2</sup>&10%  
 Screw Hook and Eye..... 14 in. # D. .... 5%  
 14 in. # D. .... 5%  
 Screw Hook and Eye..... 16 in. # D. .... 5%  
 Screw Hook and Eye..... 18 in. # D. .... 5%  
 Strap..... 22 to 36 in. # D. .... 2.5%  
 Extra 50% given on many of these Hinges.

**Hoes—Eye—**

Scovill and Oval Pattern..... 50<sup>1/2</sup>&10%  
 D. & H. Scovill. .... 20<sup>1/2</sup>&10%  
 Grub. .... 60<sup>1/2</sup>&10%  
 Lane's Crescent, Planter's Pattern..... 55<sup>1/2</sup>%  
 Lane's Razor Blade, Scovil Pat. .... 50<sup>1/2</sup>&10%

Handled—

Garden, Mortar, &c. .... 70<sup>1/2</sup>&5%  
 Magic..... 70<sup>1/2</sup>&5%  
 Stearns' Challenge..... 25<sup>1/2</sup>&10%  
 Sterling..... 50<sup>1/2</sup>&10%  
 Terry's Ideal..... 50<sup>1/2</sup>&10%  
 Terry's Modern..... 50<sup>1/2</sup>&10%  
 Terry's Shield..... 50<sup>1/2</sup>&10%  
 Terry's Solid..... 50<sup>1/2</sup>&10%  
 Terry's Wrought Single Strap..... 50<sup>1/2</sup>&10%  
 Victor, No. 1, \$15.00; No. 2, \$10.50; No. 3, \$18.00  
 Warner's Pat..... 20<sup>1/2</sup>&10%  
 Wild West..... 50<sup>1/2</sup>&10%  
 Zenith for Wood Track..... 55%

Extra 50% given on many of these Hinges.

Hoistng Apparatus—

See Machines, Hoisting.

**Hollow-Ware—**

See Ware, Hollow.

**Holders—****Bag—**

Sensible Bag and Twine..... 50%  
 Springle's Pat. .... # dos \$18. 60%  
 Extra 50% given on many of these Hinges.

**Bit—**

# dos \$24.00, 40<sup>1/2</sup>%  
 Extension. ....

Barber's, # dos \$15.00..... 40<sup>1/2</sup>&10%  
 Ives, # dos \$20.00..... 60<sup>1/2</sup>&10%  
 Extra 50% given on many of these Hinges.

**File and Tool—**

Bald Pat. .... # dos \$4.00, 25%  
 Nicholson File Holders..... 50%  
 Extra 50% given on many of these Hinges.

**Sash—**

Motley's Adj. Sash, Medium Size.....

# dos \$1.30, 40%  
 Extra 50% given on many of these Hinges.

**Hooks—****Cast Iron—**

Bird Cage, Reading. .... 90<sup>1/2</sup>&10%  
 Bird Cage, Sargent's List. .... 90<sup>1/2</sup>&10%  
 Clothes Line, Sargent's List. .... 50<sup>1/2</sup>&10%  
 Ceiling, Sargent's List. .... 50<sup>1/2</sup>&10%  
 Extra 50% given on many of these Hinges.

Table and Pocket—Net Prices.

Corn—

Bradley's. .... 35<sup>1/2</sup>&10%  
 Wadsworth's. .... 35<sup>1/2</sup>&10%  
 Extra 50% given on many of these Hinges.

**Drawing—**

Mix. P. S. & W. .... 75<sup>1/2</sup>&10%  
 Extra 50% given on many of these Hinges.

Witherby. ....

Adjustable Handle. .... 25<sup>1/2</sup>&34%  
 Extra 50% given on many of these Hinges.

Bradley's. .... 35%  
 Douglass. .... 75<sup>1/2</sup>&10%  
 Extra 50% given on many of these Hinges.

Drawing—

Mix. P. S. & W. ....

Extra 50% given on many of these Hinges.

Witherby. ....

Adjustable Handle. ....

Extra 50% given on many of these Hinges.

Bradley's. ....

Douglass. ....

Extra 50% given on many of these Hinges.

Bradley's. ....

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Extra 50% given on many of these Hinges.

Bradley's. ....

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Extra 50% given on many of these Hinges.

Bradley's. ....

Douglass. ....

Extra 50% given on many of these Hinges.

Bradley's. ....

Douglass. ....

Extra 50% given on many of these Hinges.

Bradley's. ....

Douglass. ....

Plate..... 45¢  
Romer's Night Latches..... 15¢  
R. & R. Mfg. Co., list Mar. 30, 1889..... 60&10@70¢  
Sargent & Co., list July, 1894, 60&10@70¢  
Warner's Burglar Proof, W. doz. \$8.00, 50¢

**Elevator—**

Moore's ..... 33¢  
**Padlocks—**  
Wrought Iron Padlocks:  
Britton, Graham & Mathes, list Jan., 1894..... 75¢  
Mallory, Wheeler Co., list Jan. 1, 1894..... 75¢  
Norwich Lock Mfg. Co., list June 10, 1891..... 50¢  
Russell & Erwin Mfg. Co., list June 10, 1891..... 50¢  
Sargent & Co., list January 1, 1894..... 75¢  
William Wilcox Mfg. Co., list January 1, 1894..... 75¢&20¢

Ames Sword Co. up to No. 108 incl. .... 50¢&10¢

Ames Sword Co. above No. 108..... 50¢&10¢

Barnes Mfg. Co..... 40¢&40¢&10¢

Champion Padlocks..... 40¢

A. E. Deltz, Ideal Brand, New List..... 60@60&10¢

Eagle ..... 40¢

Eureka, Eagle Lock Co. ..... 40¢&2¢

E. T. Fraim's Keystone Scandinavian, 1010 line..... 90¢&50¢

120 line..... 90¢&25¢

109 line..... 65¢

510 line..... 70¢&10¢

225, 610 and 209 lines..... 70¢

All other numbers..... 50¢&5¢

Horseshoe..... W. doz. \$9. 50@50&10¢

Hotchkiss..... 30¢

Kock's..... 30¢

Romer's Nos. 0 to 91..... 30¢

Romer's Scandinavian, &c., Nos. 100 to 505..... 15¢

Scandinavian..... 90¢&5¢

Haymaker, Barry & Co. .... 90¢

No. 1010 line..... 90¢

No. 41 line..... 50¢

No. 61 line..... 60¢

No. 21 line..... 70¢

No. 109 line..... 90¢&40¢

Star..... 60¢

Yale Lock Mfg. Co.'s..... net prices

**Sash, &c.—**

Attwell Mfg. Co. .... 25¢&33¢  
Champion Safety list January, 1893, 70¢&10¢  
Clark's No. 1, \$10; No. 2, \$8 W. gr. .... 33¢  
Common Sense, Jay'd P. Cop'd and Br'ed. .... \$4.00  
Common Sense, Nickel Plated. .... \$10.00

Corbin's Daisy, list Feb. 15, 1886..... 70¢

Davis Bronze, Barnes Mfg. Co. .... 60¢

Ferguson's..... 33¢  
Fish (Lieche's pat.), No. 100, W. gr. \$8. .... 50¢

No. 105, W. gr. \$10. .... 50¢

Giant, list Jan. 1892..... 70¢&10¢

Hammond's Window Springs..... 40¢

Hugunin's New Sash Locks.... 25¢&33¢

Hugunin's Sash Balance..... 25¢&33¢

Ives' Patent..... 60¢&10¢&5¢&10¢&10¢

Kempshall's Gravity..... 60¢

Kempshall's Model..... 60¢&60¢&10¢

Monarch..... 50¢

Payson's Perfect..... 60¢&10¢&10¢

Reading..... 60¢&10¢&60¢&10¢&10¢

Security..... 70¢

Universal..... 30¢

Victor..... 60¢&10¢&2¢

Walker's..... 10¢

Wolcott's..... 60¢&10¢&8¢

**Lumber Tools—**

See Tools, Lumber.

**Lusto—** our-ounce bottles. .... W. doz. \$1.75; W. gross. .... \$17.00

**Machines.**

**Boring—**

Without Augers, Upright, Angular.

Boss, Carpenters' 9.50

Boss, Ship Builders' 3.75

Douglas' ..... \$5.60 6.75.... 50¢

Jennings' ..... 5.60 6.75.... 50¢&50¢&5¢

Millers Falls ..... 7.50.... 25¢

Phillip's Patent with Auger.... 7.00 7.50....

Snell's, Rice's Pat. 5.60 6.75.... 40&10&10¢

**Fluting—**

American, 5 in., \$8.00; 6 in., \$8.40; 7 in.,

\$8.50 each. .... 35¢

Combined Fluter and Bed Iron. .... W. doz. \$15.00.... 30¢

Crown, 4x4 in., \$3.50; 6 in., \$4.00; 8 in.,

\$6.50 each. .... 35¢

Crown Hand Fluter, No. 1, \$15.00; 2,

\$12.50; 3, \$10.00; 4, \$8.75.... 35¢

Crown Jewel, 6 in. .... \$3.50 each. .... 35¢

Domestic Fluter. .... each, \$1.50

Eagle, 3/4-inch Rolls, \$2.15.... 35¢

Eagle, 5/4-inch Rolls, \$2.35.... 35¢

Knix, 3/4-inch Rolls. .... \$3.25 each.... 35¢

Knix, 6-inch Rolls. .... \$3.50 each.... 35¢

**Hoisting—**

Moore's Anti-Friction Differential Pulley Block. .... 20¢

Moore's Hand Hoist, with Lock Brake. .... 20¢

Moore's Rope Differential Pulley Block. .... 60¢

Mars & Beekley (Teal Patent). .... 80¢

See also Blocks.

**Washing—**

Fair and Square. .... W. doz. \$42.00

Anthony Wayne, W. doz. No. 1, \$42; No. 2, \$36; No. 3, \$42.

Wayne American. .... W. doz. \$36.00

Welsell. .... W. doz. \$36.00

Western Star W. doz. No. 2, \$36; No. 3, \$39

**Mallets—**

B. & L. Block Co., Hickory & L. V. 30&10@40¢

Fibre Head, Stearns. .... 33¢  
Hickory. .... 20¢&10¢&20¢&10¢&10¢

Lignum Vitae. .... 20¢&10¢&20¢&10¢&10¢

**Mattocks—**

Regular list..... 60&10@60&10@5¢

**Measures—**

Standard Fibreware, No. 1, peck W. doz. \$3.50; 1/2-peck, \$3.00

**Meat Cutters—**

See Cutters, Meat.

**Menders—**

Harness. .... W. doz. \$1.75

Hudson's Hose Menders, in set, W. doz. .... 36.00

Hudson's Hose Bands. .... W. gr. \$1.25

**Milk Cans—** See Cans, Milk.

**Mills—**

Coffee—

Box and Side, List Jan. 1, 1888, 60@60&10¢

Net prices are often made which are lower than above discount.

American, Enterprise Mfg. Co., list Jan.

17, 1888. .... 20¢

National List, Jan. 1, 1894. .... 30¢

Swift, Lane Bros. .... 30¢

Waddell's New Box Mills, Ideal

Brand, New List. .... 60@60&10¢

Russell & Erwin Mfg. Co., list June

10, 1891. .... 50¢  
10, 1891. .... 50¢  
Sargent & Co., list January 1, 1894. .... 75¢

William Wilcox Mfg. Co., list Janu-

ary 1, 1894. .... 75¢&20¢

Ames Sword Co. up to No. 108 incl. .... 50¢&10¢

Ames Sword Co. above No. 108..... 50¢&10¢

Barnes Mfg. Co..... 40@40¢&10¢

Champion Padlocks..... 40¢

A. E. Deltz, Ideal Brand, New List. .... 60@60&10¢

Eagle ..... 40¢

Eureka, Eagle Lock Co. ..... 40¢&2¢

E. T. Fraim's Keystone Scandinavian, 1010 line..... 90¢&50¢

120 line..... 90¢&25¢

109 line..... 65¢

510 line..... 70¢&10¢

225, 610 and 209 lines..... 70¢

All other numbers..... 50¢&5¢

Horseshoe..... W. doz. \$9. 50@50&10¢

Hotchkiss..... 30¢

Kock's..... 30¢

Romer's Nos. 0 to 91..... 30¢

Romer's Scandinavian, &c., Nos. 100 to 505..... 15¢

Scandinavian..... 90¢&5¢

Haymaker, Barry & Co. .... 90¢

No. 1010 line..... 90¢

No. 41 line..... 50¢

No. 61 line..... 60¢

No. 21 line..... 70¢

No. 109 line..... 90¢&40¢

Star..... 60¢

Yale Lock Mfg. Co.'s..... net prices

**Sash, &c.—**

Attwell Mfg. Co. .... 25¢&33¢

Champion Safety list January, 1893, 70¢&10¢

Clark's No. 1, \$10; No. 2, \$8 W. gr. .... 33¢

Common Sense, Jay'd P. Cop'd and Br'ed. .... \$4.00

Common Sense, Nickel Plated. .... \$10.00

Corbin's Daisy, list Feb. 15, 1886..... 70¢

Davis Bronze, Barnes Mfg. Co. .... 60¢

Ferguson's..... 33¢

Fish (Lieche's pat.), No. 100, W. gr. \$8. .... 50¢

No. 105, W. gr. \$10. .... 50¢

Giant, list Jan. 1892..... 70¢&10¢

Hammond's Window Springs..... 40¢

Hugunin's New Sash Locks.... 25¢&33¢

Hugunin's Sash Balance..... 25¢&33¢

Ives' Patent..... 60¢&10¢&5¢&10¢&10¢

Kempshall's Gravity..... 60¢

Kempshall's Model..... 60¢&60¢&10¢

Monarch..... 50¢

Payson's Perfect..... 60¢&10¢&10¢

Reading..... 60¢&10¢&60¢&10¢&10¢

Security..... 70¢

Universal..... 30¢

Victor..... 60¢&10¢&2¢

Walker's..... 10¢

Wolcott's..... 60¢&10¢&8¢

**Saw Tools, Lumber.**

See Tools, Lumber.

**Lusto—** our-ounce bottles. .... W. doz. \$1.75; W. gross. .... \$17.00

**Machines.**

**Boring—**

Without Augers, Upright, Angular.

Boss, Carpenters' 9.50

Boss, Ship Builders' 3.75

Douglas' ..... \$5.60 6.75.... 50¢

Jennings' ..... 5.60 6.75.... 50¢&50¢&5¢

Millers Falls ..... 7.50.... 25¢

Phillip's Patent with Auger.... 7.00 7.50....

Snell's, Rice's Pat. 5.60 6.75.... 40¢&10¢&10¢

**Fluting—**

American, 5 in., \$8.00; 6 in., \$8.40; 7 in.,

\$8.50 each. .... 35¢

In packages of 100 lb., add 1-10¢ W. doz. .... net;

in packages less than 100 lb., add 1/4 W. doz. .... net.

**Hoisting—**

See Tools, Hoisting.

**Washing—**

Fair and Square. .... W. doz. \$42.00

Anthony Wayne, W. doz. No. 1, \$42; No. 2, \$36; No. 3, \$42.

Wayne American. .... W. doz. \$36.00

Welsell. .... W. doz. \$36.00

Western Star W. doz. No. 2, \$36; No. 3, \$36.00

88¢

**Mallets—**

B. & L. Block Co., Hickory & L. V. 30&10@40¢

Fibre Head, Stearns. .... 33¢

Hickory. .... 20¢&10¢&20¢&10¢&10¢

Lignum Vitae. .... 20¢&10¢&20¢&10¢&10¢

**Mattocks—**

Regular list..... 60&10@60&10@5¢

**Measures—**

Standard Fibreware, No. 1, peck W. doz. \$3.50; 1/2-peck, \$3.00

**Packing, Steam—**

Rubber—

Standard, fair quality. .... 70@10@75¢

Inferior quality. .... 75@10@80¢

Extra. .... 80@10@85@10@9

**Pullers Nail-**

Holmes..... \$ per doz. \$24.00 40%  
Economy..... \$ per doz. \$5.50 @ 40%  
Murch..... \$ per doz. \$10.00  
Giant, No. 1..... \$ per doz. \$18.00 10%  
Scent, No. 2..... \$ per doz. \$15.00 10%  
Pelican..... \$ per doz. \$9.00 25% & 10%  
Scranton..... \$ per doz. \$18.00 33 1/3% & 10%

**Pulleys-**

Brass Screw..... 70¢  
Hay Fork, "Anti-Friction," 5 in. solid, \$6.70..... 50¢  
Hay Fork, "F" Common and Patent Bushed..... 20¢  
Hay Fork, Moore's Anti-Friction 5 in. Wheel, \$ per doz. \$12.00..... 40¢  
Hay Fork, Reed's Self-Lubricating..... 60¢  
Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50..... 50¢ 10¢ & 50¢ 10¢  
Hay Fork Stearns' Nos. 35 & 50 & 10%  
Hay Fork Stearns' Nos. 15, 25, 55, 65 60¢  
Hay Fork, Tarbox Pat. Iron..... 20¢  
Hot House Awning, &c. .... 60¢ & 70¢  
Japanned Clothes Line..... 60¢ & 10¢ & 10%  
Japanned Screw..... 70¢ & 10¢ & 10%  
Japanned Side..... 70¢ & 10¢ & 10%  
Moore's Ceiling or End, Anti-Friction 40¢  
Moore's Dumb Waiter, Anti-Friction 60¢  
Moore's Electric Light ..... 38¢  
Moore's Side, Anti-Friction ..... 60¢  
Cash (Auger Mortise). On doz. lots ex. 60¢  
Common Sense ..... 60¢  
Eureka ..... 60¢  
Aerom. Ideal, Nos. 2, 4, 10 & 15 ..... 60¢ less 14%  
Star. Ideal or IXL No. 60. \$ per doz. 22¢ net  
Shade Rock ..... 55¢  
Shepard's Niagara, No. 25. \$ per doz. 28¢ net  
Tackie Blocks—See Blocks.

**Pumps—**

Cistern, Best Makers..... 60¢ & 10¢ & 70¢  
Pitcher Spout, Best Makers. 70¢ @ 10¢ & 50¢  
Pitcher Spout, Cheaper G'd's. 75¢ & 10¢ & 80¢  
Myers' Pumps, low flat ..... 50¢  
Detroit Valve & Washer Co., Pump Leathers ..... \$ per gro \$6.00

**Punches—**

Avery's Revolving ..... 40¢  
Avery's Sawset and Punch—See Sawsets  
Bemis & Call Co.'s Cast Steel Drive. 50¢ & 55¢  
Bemis & Call Co.'s Check ..... 55¢  
Bemis & Call Co.'s Spring ..... 50¢ & 55¢  
B. mis & Call Co.'s Springfield Socket. 65¢  
Niagara Hollow Punches ..... 20¢ & 25¢  
Niagara Solid Punches ..... 55¢  
Rice Hand Punches ..... 15¢  
Saddler's or Drive, good. \$ per doz. 60¢ & 65¢  
Spring, good quality. \$ per doz. \$5.00 & \$2.50  
Spring, Leach's Fat ..... 15¢  
Gold Tinner's, P. S. & W. Co. \$ per doz. 51.44..... 55¢  
Tanners' Hollow Punches, P. S. & W. Co. ..... 20¢ & 25¢

**Rail—**

Barn Door, Light. In. 3/4" 3/4" 3/4"  
Per 100 feet..... \$1.75 2.10 2.75  
B. D. for N. E. Hangers—  
Small. Med. Large.  
Per 100 feet..... \$2.00 2.50 3.00 Net  
Carrier, double braced, Steel Rail, \$ per foot ..... 34¢  
Lundy Parlor Door, Planed Edge. \$ per ft. 75¢  
Moody Steel Rail. # ft. 5¢ ..... 45¢ & 55¢  
Moore's Steel Rail ..... 35¢  
Sliding Door, Bronzed W't Iron. \$ per ft. 45¢  
Sliding Door, W't Iron, Painted. \$ per ft. 25¢  
Victor Track Rail. \$ per ft. 45¢  
Victor Track Rail. 7/8" W foot. .... 50¢ & 10¢

**Rakes—**

Cast Steel, Association g'd's. 70¢ & 75¢  
Cast Steel, outside goods. 70¢ & 75¢ & 82¢  
Malleable, good. 70¢ & 75¢  
Malleable, low grade. .... 75¢  
Fort Madison Prise Bow Brace and Peerless ..... 65¢  
Fort Madison Steel Tooth Lawn Rake, \$4.00..... 25¢  
Gibbs. .... 25¢  
Gibbs' Acme Lawn Rake. \$ per doz. \$4.90  
Gibbs' Canton Lawn Rake. \$ per doz. \$4.75  
Gibbs' Crown Lawn Rake, No. 1. .... \$ per doz. \$4.90; No. 2. \$5.30  
Gibbs' Favorite Lawn Rake. \$ per doz. \$3.90  
Gibbs' Hustler No. 0. .... \$ per doz. \$4.25  
Gibbs' Hustler No. 1. .... \$ per doz. \$4.40  
Oneida Lawn Rake. .... \$ per doz. \$6.00

**Razors—**

Campbell Cutlery Co. .... 50¢  
Electric Cutlery Co. .... Net prices  
Galvanic. .... \$ per doz. \$15.00  
Jordan's AAA, new list. .... Net prices  
Jordan's Old Faithful, new list. Net prices  
J. R. Torrey Razor Co. .... Net prices  
Wostenholm and Butcher, \$10 to 2¢ & 10¢

**Razor Straps—**

See Straps, Razor.

**Reels—**

Clothes Line—  
Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver Rubber, Populo and Salmon, Single Action, Multiplying and Quadrupling, all sizes. .... 25¢  
Hendryx Single Action, new list. 102P and PN, 202P and PN, 102P and PRN, 202P and PRN, 404P and PN, 00304P and PN, 505P and 502N, 802 and 802N, 02804N, Competitor, 50% Hendryx Multiplying and Quadrupling Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002804PN, 0924 and 0924N, 5009N and PN. .... 40¢ & 10¢

**Registers—**

Moore's Bronze Finishes ..... 75¢  
Moore's Electropolished ..... 80¢  
Moore's Japanned ..... 80¢  
Moore's Solid Bronze ..... 70¢  
Moore's Stove Pipe ..... 83¢

**Rings and Ringers—**

Bull Rings—  
Hotchkiss' low list. .... 40¢  
Humason, Beckley & Co.'s. .... 75¢  
Peck, Stow & W. Co.'s. .... 60¢ & 60¢ & 10¢  
Sargent's. .... 80¢ & 80¢ & 10¢

**Hog Rings and Ringers—**  
Note.—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

**Rivets and Burrs—**  
Copper. .... 40¢ & 20¢ & 10¢  
Iron Norway, list Nov. 1, 1894. .... 65¢  
Second Quality ..... 5¢

**Rivet Sets—See Sets.****Roasting and Baking Pans—See Pans, Roasting and Baking.****Rods—**

Stair, Black Walnut. .... \$ per doz. 40¢  
Stair, Brass. .... 25¢ & 30¢

**Rollers—**

Acme Moore's Anti-Friction ..... 50¢ & 10¢  
Auto Door, Sargent's list. .... 60¢ & 10¢ & 10%  
Moore's Barn Door Stay. .... 50¢

Union Barn Door Roller. .... 70¢  
Thompson Mfg. Co.'s Lawn Rollers. .... 30¢

**Rope—**The following prices are for D. New York or factory, and are shaded D. 25¢ & 10% on large lots; terms, 1 1/2% for

Manila, 7 1/2 in. diam. and larger. .... 8 @ 83 1/3¢

Manila. .... 6 1/2 in. diam. .... 8 @ 83 1/3¢

Manila, 5 1/2 in. diam. .... 8 @ 83 1/3¢

Manila, Tarred Rope. .... 8 @ 83 1/3¢

Manila, Hay Rope. .... 8 @ 83 1/3¢

Sisal. .... 7 1/2 in. and larger. .... 8 @ 83 1/3¢

Sisal. .... 6 1/2 in. .... 8 @ 83 1/3¢

Sisal. .... 5 1/2 in. .... 8 @ 83 1/3¢

Sisal. .... 4 1/2 in. .... 8 @ 83 1/3¢

Sisal. .... 3 1/2 in. .... 8 @ 83 1/3¢

Sisal. Medium Lath Yarn. .... 8 @ 83 1/3¢

New Zealand. .... 7 1/2 in. and larger. .... 8 @ 83 1/3¢

New Zealand. .... 6 1/2 in. .... 8 @ 83 1/3¢

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New Zealand. ....



<b>Silver Plated, Hollow-</b> 4 mo. or 5 % cash in 30 days. Meriden Britannia Co.	<b>Washer Cutters—</b> See Cutters, Washers.	<b>Cast Steel Wire</b> ..... 50¢ <b>Copper</b> , list Jan. 18, 1884..... 40¢@55¢
<b>Reed &amp; Barton</b> ..... 40¢@55¢	<b>Water Coolers—</b> See Coolers, Water.	<b>Galvanized Fence</b> ..... 75¢@105¢
<b>Rogers &amp; Brothers</b> ..... 40¢@55¢	<b>Wedges—</b>	<b>Malin's An'aled &amp; Tin'd on Spools</b> , 60¢@85¢
<b>Simpson Hall, Miller &amp; Co.</b> ..... 40¢@55¢	<b>Iron</b> ..... <b>D 24¢@24¢</b>	<b>Malin's Brass and Cop. on Spools</b> , 60¢@85¢
<b>Harford Silver Plate Co.</b> ..... 40¢@55¢	<b>Steel</b> ..... <b>D 32¢@32¢</b>	<b>Steel Music Wire</b> , 12 to 30, imported..... 60¢@70¢ <b>W D</b>
<b>William Rogers Mfg. Co.</b> .....	<b>Weights</b> ..... <b>Wash</b> .....	<b>Stubs' Steel Wire</b> , \$6.00 to 2, 30¢ <b>Tate's Spooled, Tin'd &amp; Annealed</b> , 60¢@85¢ <b>Tate's Spooled Cop. and Brass</b> , 50¢@85¢ <b>Timed Broom Wire</b> , 18 to 21, <b>W D</b> , 14¢ <b>Wire Cloth Line, see Lines</b> . <b>Wire Picture Cord, see Cord</b> .
<b>Washers—</b> Size hole, 5-16 36 16 56 1014 Washers, 4.80 3.30 2.55 2.30 In lots less than 2000, <b>W D</b> , add 14¢ to 15¢ boxes 1¢ to list.	<b>Well Buckets Galvanized</b> —See Pails, Galvanized.	<b>Bright Wire Goods—</b> Standard list..... 90¢@90¢@15%
<b>Whips</b>		<b>Wire Cloth and Netting—</b> Galvanized Wire Netting..... 80¢@80¢@10¢@15¢
American Whip Co.: Length, 4 1/2 5 5 1/2 6 6 1/2 7 7 1/2 8 ft. X. L. Whalebone Drivin', \$18.00 20.00 22.00 24.00 27.00 30.00 33.00 36.00 Eureka, Two-thirds Whalebone..... 15.00 16.50 18.00 20.00 .....		<b>Painted Screen Cloth</b> , 100 ft. \$1.40@\$1.45
Bull Bone, Half-length Whale bone..... 11.00 12.00 13.00 15.00 .....		<b>Wire Barb—</b> See Trade Report.
American Standard..... 8.00 8.50 9.50 10.50 12.00 13.50 15.00 16.50 True Grip, Raw Hide Center..... 6.00 6.00 6.50 7.00 7.50 9.00 .....		<b>Wire Rope—See Rope, Wires.</b>
New Name, Stocked Java, Black and Wine Colors..... .....	For dozen.	<b>Wrenches—</b>
American, 93 Pen Whip..... .....		American Adjustable..... 40¢@40¢@10¢ Baxter's..... 60¢@60¢@10¢
Gents' Light Driving No. 111..... .....		Coe's Genuine..... 50¢@50¢@10¢ Coe's "Mechanics"..... 50¢@10¢@15¢
Gents' Light Driving No. 106..... .....		Girard..... 65¢@10¢@70¢
Hand-made Stocked Java No. 108..... 8.75 4.00 .....		Lamson & Sessions' Engineers..... 60¢@10¢ Lamson & Sessions' Standard..... 70¢@10¢
A large variety of cheaper grades..... .....		Girard Agricultural..... 75¢@10¢@15¢ F. E. & W. Agricultural..... 60¢@8¢@5¢
Team Whips..... .....		W. B. & W. Diamond..... 50¢@50¢@10¢ Acme, Bright..... 50¢@50¢@10¢
Toy Whips..... .....		
Hardware Assortment, 10/American, 75 Whips for \$50.00.		
<b>Wire and Wire Goods—Iron</b>		
Market, Br. & Ann., Nos. 0 to 18, 75¢@10¢@15¢		
Br. & Ann., Nos. 0 to 18, Extra 6¢@10% given and low net prices often made on large lots.		
Cop'd, Nos. 0 to 18, 75¢@10¢@15¢		
Galv., Nos. 0 to 18, 70¢@10¢@15¢		
Tin'd, Tin'd, list, Nos. 0 to 18, 75¢@10¢@15¢		

<b>Wheels Well—</b>	<b>Stone,</b>	<b>Stone,</b>
8 in., \$2.00; 10 in., \$2.50; 12 in., \$2.75	Br. and Ann'd.	Nos. 19 to 18..... 82¢@5¢@5¢
		Nos. 19 to 20..... 82¢@5¢@5¢
		Nos. 27 to 36..... 82¢@5¢@5¢
		Annealed Wire on Spools..... 60¢@
		Brass, list Jan. 18, 1884..... 40¢@5¢

## Paints, Oils and Colors.—Wholesale Prices.

<b>Animal and Vegetable Oils—</b>	<b>Paints and Colors—</b>	<b>Zinc, French, Green Seal</b> ..... 84¢@ 9 <b>Zinc, French, V. M. X.</b> ..... 6 @ 7 <b>Zinc, Antwerp, Red Seal</b> ..... 6 @ 6¢@ 7 <b>Zinc, Antwerp, Green Seal</b> ..... 5 @ 5¢@ 7 <b>Zinc, German, L. Z. O.</b> ..... 5 @ 5 <b>Zinc, V. M. in Poppy Oil, G. Seal</b> , lots of 1 ton and over..... 10¢@ 10 <b>Zinc, V. M. in Poppy Oil, Red Seal</b> ..... 11 @ 10 <b>Zinc, lots of 1 ton and over</b> ..... 10¢@ 10 <b>Zinc, Red Seal</b> ..... 11 @ 10 <b>Zinc, lots of 1 ton and over</b> ..... 10¢@ 10 <b>Zinc, Red Seal</b> ..... 11 @ 10 <b>DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbls. lots of one or assorted grades, 1/2; 25 bbls., 2%; 50 bbls., 4%. No discount allowed on less than bbl. lots.</b>
Linseed, City, raw.. per gal. 5 1/2 @ ..	Cylinder Light, filtered..... 12 @ 16 Cylinder, dark, filtered..... 10 @ 13 Paraffine, 23¢@24 gravity..... 11 @ 12 Paraffine, 28 gravity..... 9 1/2 @ 10 1/2 Paraffine, 28 gravity..... 9 1/2 @ 10 1/2	<b>Colors in Oil—</b>
Linseed, City, boiled..... 5 1/2 @ 5 1/2		Black, Drop, Frankfort..... 25 @ 30 Black, Drop, English..... 12 @ 15 Black, Drop, Domestic..... 7 @ 10 Black, Lampblack, Best..... 20 @ 25 Black, Lampblack, Common..... 7 @ 13 Black, Ivory..... 8 @ 15 Blue, Chinese..... 6 @ 8 Blue, Prussian..... 25 @ 40 Blue, Ultramarine..... 8 @ 25 Brown, Spanish..... 1 1/2 @ 1 Brown, Vandyke, Amer. 3 @ 3 1/2 Brown, Vandyke, English..... 6 @ 8 Carmine, No. 40, in bulk, 2.00 @ .. Carmine, No. 40, in boxes or barrels..... 2.10 @ .. Carmine, No. 40, in ounce bottles..... 3.00 @ .. Chalk, in bulk..... 1 1/2 ton. 1.75 @ 2.00 Chalk, in bbls., 100 lb. 33 @ 40 China Clay, English..... 1 ton. 13.00 @ 18.00 Cobalt Oxide, prep'd..... 9.00 @ 11.00 Cobalt Oxide, black..... 100 lb. 1.90 @ .. Cobalt Oxide, black..... less 100 lb. 1.96 @ .. Green, Paris, in bulk..... 2 @ 23 Green, Paris, 170 @ 175 lb kgs..... 22 @ 34 Green, Paris, small pack, 25 @ 29¢ Rebates—3¢@bbl on lots of 10,000 lb or over; 2 1/2¢@bbl on 4000 to 10,000 lb; 2¢@bbl on 2000 to 4000 lb; 1 1/2¢@bbl on 1000 to 2000 lb; 1¢@bbl on 500 to 1000 lb purchased during the season.
Linseed, Western, raw..... 6 @ ..		Powdered..... 1 1/2 @ 14 Talc, French..... 1 1/2 @ 14 Terra Alba, F'rech. 100 lb 65 @ 75 Terra Alba, English..... 65 @ 75 Terra Alba, Amer. No. 1 65 @ 75 Terra Alba, American No. 2 45 @ 50 Umbre, Turkey, Burnt and Powdered..... 10 @ 25 Umbre, Turkey Bnt. Ln. 22 @ 34 Umbre, Turkey, Raw and Powdered..... 2 1/2 @ 34 Umbre, Turkey, R'w Lumps 2 1/2 @ 24 Umbre, Turkey, Bnt. Amer. 1 1/2 @ 17 Umbre, Turkey, R'w Amer. 1 1/2 @ 17 Yellow, Chrome..... 10 @ 25 Vermilion, American Lead..... 11 @ 12 Vermilion, Quicks'r, bulk..... 65 @ .. Vermilion, Quicks'r, bags..... 50 @ .. Vermilion, Quicks'r sm'r pkgs..... 60 @ 65 Vermilion, English Import..... 60 @ .. Vermilion, Imitation, Eng. 8 @ 80 Vermilion, Trieste..... 90 @ 95 Vermilion, Chinese..... 85 @ 61.00 Whiting Common, \$100 lb 40 @ 55 Whiting Gilders' 50 @ 55 Zinc, American, dry.... 7 @ 7 1/2 Zinc, French, Red Seal..... 7 @ 7 1/2
Cottonseed, Extra Winter..... 6 @ ..		
Cottonseed, Extra Winter, low, prime..... 31 @ 32		
Cottonseed, Extra Winter, low, off grades..... 30 @ 31		
Sperm, Crude..... 56 @ ..		
Sperm, Natural Spring..... 56 @ ..		
Sperm, Bleached Spring..... 61 @ ..		
Sperm, Natural Winter..... 68 @ ..		
Sperm, Bleached Winter..... 68 @ ..		
Whale, Crude..... 32 @ ..		
Whale, Natural Winter..... 41 @ ..		
Whale, Bleached Winter..... 41 @ ..		
Whale, Extra Bleached, Elephant, Bleached	25 @ ..	
Winter..... 20 @ ..		
Monhaden, Crude, Sound..... 26 @ ..		
Monhaden, Crude, Southern..... 25 @ ..		
Monhaden, Light Pressed..... 33 @ ..		
Monhaden, Bleached Winter..... 35 @ ..		
Monhaden, Extra Bleached..... 51 @ ..		
Tallow, City, prime..... 50 @ ..		
Tallow, Western, prime..... 50 @ ..		
Cocoanut, Ceylon..... 5 1/2 @ 5 1/2		
Cocoanut, Cochin..... 6 1/2 @ 6 1/2		
Cod, Domestic..... 30 @ ..		
Cod, Foreign..... 30 @ ..		
Red Elaine..... 85 @ ..		
Red Saponified..... 44 @ 44		
Bank..... per gal	4 1/2 @ 4 1/2	
Straits..... 25 @ ..		
Olive, Italian, bbls..... 58 @ ..		
Neatsfoot, prime..... 60 @ ..		
Palm, prime, Lagos..... 5 1/2 @ 5 1/2		
<b>Mineral Oils—</b>		
Black, 29 gravity, 25 @ 30 cold test..... 6 1/4 @ 7 1/4		
Black, 29 gravity, 16 cold test..... 7 @ 8		
Black, 29 gravity, summer..... 5 1/2 @ 6 1/2		

## THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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ONE MONTH 7.50  
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Adjustable S..... 35¢@5¢  
Brigg's Pattern..... 30¢@10¢  
Combination Black..... 40¢@10¢  
Combination Bright..... 40¢@5¢  
Cylinder or Gas Pipe..... 45¢@5¢  
Extra Heavy..... 45¢@5¢  
Merrick's Pattern..... 45¢@5¢  
No. 3 Pipe Bright..... 54¢@5¢  
Bit Wrench, Adj., Tatum's..... 2.25¢@2.25¢  
Boardman's..... 30¢@30¢  
Cincinnati Brass Wrenches..... 25¢@10¢  
Diamond Steel..... 55¢@5¢  
Donohue's Engineer..... 20¢@10¢  
Eagle..... 60¢@10¢  
Hercules..... 70¢@70¢  
Taft's Vice Wrench..... 55¢@10¢  
Tatum's Brace..... 25¢@10¢  
The Favorite Pocket, 1/2 doz \$4...40¢@40¢  
Walker's..... 55¢@5¢  
Webster's Pat. Combination..... 25¢@5¢

Acme, Nickeled..... 40¢@40¢@5¢  
Alken's Pocket (Bright)..... 82.50¢@82.50¢  
Alligator..... 60¢@60¢@10¢  
Always Ready..... 83¢@10¢@40¢@5¢

Cast Steel Wire..... 50¢  
Copper, list Jan. 18, 1884..... 40¢@55¢  
Galvanized Fence..... 75¢@105¢  
Malin's An'aled & Tin'd on Spools, 60¢@85¢  
Malin's Brass and Cop. on Spools, 60¢@85¢  
Steel Music Wire, 12 to 30, imported..... 60¢@70¢ **W D**

Stubs' Steel Wire..... \$6.00 to 2, 30¢  
Tate's Spooled, Tin'd & Annealed, 60¢@85¢  
Tate's Spooled Cop. and Brass, 50¢@85¢  
Timed Broom Wire, 18 to 21, **W D**, 14¢  
Wire Cloth Line, see Lines.  
Wire Picture Cord, see Cord.

Bands & Call's:  
Adjustable S..... 35¢@5¢  
Brigg's Pattern..... 30¢@10¢  
Combination Black..... 40¢@10¢  
Combination Bright..... 40¢@5¢  
Cylinder or Gas Pipe..... 45¢@5¢  
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Tatum's Brace..... 25¢@10¢  
The Favorite Pocket, 1/2 doz \$4...40¢@40¢  
Walker's..... 55¢@5¢  
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Donohue's Engineer..... 20¢@10¢  
Eagle..... 60¢@10¢  
Hercules..... 70¢@70¢  
Taft's Vice Wrench..... 55¢@10¢  
Tatum's Brace..... 25¢@10¢  
The Favorite Pocket, 1/2 doz \$4...40¢@40¢  
Walker's..... 55¢@5¢  
Webster's Pat. Combination..... 25¢@5¢

Acme, Nickelized..... 40¢@40¢@5¢  
Alken's Pocket (Bright)..... 82.50¢@82.50¢  
Alligator..... 60¢@60¢@10¢  
Always Ready..... 83¢@10¢@40¢@5¢

Cast Steel Wire..... 50¢  
Copper, list Jan. 18, 1884..... 40¢@55¢  
Galvanized Fence..... 75¢@105¢  
Malin's An'aled & Tin'd on Spools, 60¢@85¢  
Malin's Brass and Cop. on Spools, 60¢@85¢  
Steel Music Wire, 12 to 30, imported..... 60¢@70¢ **W D**

Stubs' Steel Wire..... \$6.00 to 2, 30¢  
Tate's Spooled, Tin'd & Annealed, 60¢@85¢  
Tate's Spooled Cop. and Brass, 50¢@85¢  
Timed Broom Wire, 18 to 21, **W D**, 14¢  
Wire Cloth Line, see Lines.  
Wire Picture Cord, see Cord.

Bands & Call's:  
Adjustable S..... 35¢@5¢  
Brigg's Pattern..... 30¢@10¢  
Combination Black..... 40¢@10¢  
Combination Bright..... 40¢@5¢  
Cylinder or Gas Pipe..... 45¢@5¢  
Extra Heavy..... 45¢@5¢  
Merrick's Pattern..... 45¢@5¢  
No. 3 Pipe Bright..... 54¢@5¢  
Bit Wrench, Adj., Tatum's..... 2.25¢@2.25¢  
Boardman's..... 30¢@30¢  
Cincinnati Brass Wrenches..... 25¢@10¢  
Diamond Steel..... 55¢@5¢  
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# CURRENT METAL PRICES.

NOVEMBER 7, 1894.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

**IRON AND STEEL—****Bar Iron from Store—**

Common Iron:	Duty, 0.6¢ per lb.
1/2 to 2 in. round and square.....	1.50¢ @ 1.60¢
1 to 6 in. x 3/4 to 1 in.....	

Refined Iron:

3/4 to 2 in. round and square.....

1 to 4 in. x 3/4 to 1 1/2 in.....

4 1/2 to 6 in. x 3/4 to 1 in.....

1 to 8 in. x 3/4 and 1 in.....

Rods .5¢ and 1 1/2 round and square.....

Bands .1 to 6 x 3/16 to No. 12.....

"Burden's Best" Iron, base price.....

Burden's "H. B. &amp; S." Iron, base price.....

"Ulster".....

Norway Bars.....

Norway Shapes.....

Merchant Steel from Store—

Open Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....

Best Cast Steel, base price in small lots.....

Best Cast Steel Machinery, base price in small lots.....

Soft Steel Sheets—

1/4 x 8-16 inch.....

No. 8.....

No. 10.....

No. 12.....

No. 14.....

No. 16.....

No. 18.....

No. 20.....

No. 22.....

Sheet Iron from Store—

Black—

Common R. G. Cleaned American American.....

Nos. 10 to 16.....

Nos. 17 to 21.....

Nos. 22 to 24.....

Nos. 25 and 26.....

No. 27.....

No. 28.....

No. 29.....

American B. B. ....

Russia, Planished, &amp;c.—

Genuine Russia, according to assortment.....

Patent Planished.....

Craig Polished Sheet Steel.....

Galvanized—

Nos. 10 to 16.....

Nos. 17 to 21.....

Nos. 22 to 24.....

No. 27.....

No. 28.....

No. 29.....

No. 30.....

Foreign Steel from Store—

Best Cast.....

Extra Cast.....

Swaged, Cast.....

Best Double Shear.....

Blister, 1st quality.....

German Steel, Best.....

2d quality.....

3d quality.....

Sheet Cast Steel, 1st quality.....

2d quality.....

3d quality.....

R. Mushet's "Special".....

" " Annealed.....

" " " Titanic".....

Eicken's Special No. 8.....

" Extra.....

**METALS—****Tin—**

Duty.—Pigs, Bars and Block, Free. Per lb.

Bars, Pigs.....

@ 19¢ @ 19¢

Straits, Pigs.....

@ 17¢ @ 17¢

Straits in Bars.....

@ 18¢ @ 18¢

**Tin Plates—**

Duty: 1.2¢ per lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality.

Per box.

Melyn and Calland Grade—IC, 10 x 14.....

" " " " IC, 12 x 12.....

" " " " IC, 14 x 20.....

" " " " IC, 20 x 28.....

" " " " IX, 10 x 14.....

" " " " IX, 12 x 12.....

" " " " IX, 14 x 20.....

" " " " IX, 20 x 28.....

" " " " DC, 12 x 17.....

" " " " DC, 14 x 17.....

" " " " DX, 12 x 17.....

" " " " DX, 14 x 17.....

Allaway Grade.....

" " " " IC, 10 x 14.....

" " " " IC, 12 x 12.....

" " " " IC, 14 x 20.....

" " " " IC, 20 x 28.....

" " " " IX, 10 x 14.....

" " " " IX, 12 x 12.....

" " " " IX, 14 x 20.....

" " " " IX, 20 x 28.....

" " " " DC, 12 x 17.....

" " " " DC, 14 x 17.....

Coke Plates—Bright—

Guaranteed Plates command special prices, according to quality.

Dean Grade—IC, 14 x 20.....

" " " " 20 x 28.....

IX, 14 x 20.....

" " " " 20 x 28.....

Abecarne Grade—IC, 14 x 20.....

" " " " 20 x 28.....

IX, 14 x 20.....

" " " " 20 x 28.....

Tin Boiler Plates—

XXX, 14 x 28.....

" " " " 112 sheets.....

XXX, 14 x 28.....

" " " " 112 sheets.....

XXX, 14 x 31.....

" " " " 112 sheets.....

American Terne Plates—

IC, 14 x 20.....

" " " " 11.50

IC, 20 x 28.....

" " " " 11.00

IX, 14 x 20.....

" " " " 6.50

IX, 20 x 28.....

" " " " 5.50

Abecarne Grade—IC, 14 x 20.....

" " " " 11.50

IX, 14 x 20.....

" " " " 8.50

IX, 20 x 28.....

" " " " 9.50

Tin Boiler Plates—

XXX, 14 x 28.....

" " " " 11.50

XXX, 14 x 28.....

" " " " 11.00

XXX, 14 x 31.....

" " " " 13.25

**Copper—**

DUTY: Pig, Bar and Ingots and Old Copper, free. Manufactured (including all articles of which Copper is a component of chief value), 20% ad valorem.

**Ingot—**

Lake..... @ 10¢

Ansonia grade Arizona..... @ 10¢

Ansonia grade Casting..... @ 9¢

List March 22, 1894. Stubs' gauge standard. Net.

**Sheet and Bolt—**

List April 9, 1894.

Weights per sq. foot and prices per pound.

Common High Brass:	in.	in.	in.	in.	in.	in.
Wider than	24	26	28	30	32	34
and including	26	28	30	32	34	36
	28	30	32	34	36	38
To No. 20, inclusive.....	.39	.42	.46	.50	.55	.60
Nos. 21, 22, 23 and 24.....	.40	.43	.47	.51	.56	.61
Nos. 25 and 26.....	.41	.44	.48	.52	.57	.63
Nos. 27 and 28.....	.42	.45	.49	.53	.58	.65

\* Special price not less than 80 cents. Discount from List 40%.

**Wire in Coils.**

List April 9, 1894.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'g bronze and copper
All Nos. to No. 10, inclusive.....	\$0.23	\$0.27	\$0.31
Above No. 10 to No. 18.....	23 1/2	27 1/2	31 1/2
No. 17 and No. 18.....	24	28	32
No. 19 and No. 20.....	25	29	33
No. 21.....	26	30	34
No. 22.....	27	31	35
No. 23.....	28	32	36
No. 24.....	30	34	38
No. 25.....	32	36	40
No. 26.....	35	39	43
No. 27.....	38	42	46
No. 28.....	42	46	51
No. 29.....	45	49	54
No. 30.....	48	52	56
No. 31.....	51	55	57
No. 32.....	55	59	63
No. 33.....	59	63	62
No. 34.....	64	68	65
No. 35.....	70	74	1.30
No. 36.....	76	80	1.50
No. 37.....	1.00	1.04	1.70
No. 38.....	1.30	1.34	2.00
No. 39.....	2.00	2.00	3.25
No. 40.....	2.60	2.50	5.75

Discount, 40%.

Spring Wire, 2¢ per lb. advance.

**Copper Belt and Hose Rivets and Burrs—**

Per lb.	Per lb.
No. 5.....	.49¢
No. 6.....	.49¢
No. 7.....	.49¢
No. 8.....	.50¢
No. 9.....	.52¢
No. 10.....	.54¢

60% @ 5% discount.

**Tobin Bronze—Rods.**

Drawn Rods for Bolts, Forgings, &amp;c.

1/4 to 3/8 inches inclusive..... 17¢ per lb.

Over 3/4 to 5 inches inclusive..... 18¢ per lb.

**Piston Rods, Finished True, Smooth and Straight.**

1/4 to 3/8 inches inclusive..... 18¢ per lb.

Over 3/4 to 5 inches inclusive..... 19¢ per lb.

**Spelter—**

Duty: In Blocks or Pigs, 1¢ per lb.

Western Spelter..... 4¢ per lb.

Bertha (pure)..... 8¢ per lb.

**Zinc—**

Duty: Sheet, 1.25¢ per lb.

600 lb. casks..... 5¢ per lb.

Per lb..... 5¢ per lb.

**Lead—**

Duty: Pigs and Bars and Old, 1¢ per lb. Pipe and Sheets, 1.25¢ per lb.

Bar..... 4¢ per lb.

Pipe, subject to discount 20%..... 5¢ per lb.

Linéed Pipe, subject to discount 20%..... 15¢ per lb.

Block Tin Pipe, subject to discount 20%..... 35¢ per lb.

Sheet, subject to discount 20%..... 6¢ per lb.

Old Lead in exchange, 2¢ per lb.

**Solder—**

1/4 @ 1/4..... 12¢

No. 1..... 10¢

Prices of Solder indicated by private brands vary according to composition.

**Antimony—**

Free of duty.

Cookson..... 10¢ per lb.

Hallett's..... 10¢ per lb.

**Aluminum—**

Duty: 10¢ per lb.

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots..... 6¢ per lb.

100-lb. lots..... 5¢ per lb.

Ton lots..... 5¢ per lb.

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots..... 5¢ per lb.

100-lb. lots..... 5¢ per lb.

Ton lots..... 5¢ per lb.

**Old Metals—**

Dealers' Purchasing Prices Paid in New York.

Heavy Copper..... 6¢ per lb.

Light and Tinned Copper..... 6¢ per lb.

Heavy Brass..... 4¢ per lb.

Light Brass..... 3¢ per lb.

Lead..... 2¢ per lb.

Tea Lead..... 2¢ per lb.

Zinc..... 2¢ per lb.

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